ARCHIVES OF OPHTHALMOLOGY.

ON THE EXTRACTION OF CHIPS OF IRON OR STEEL FROM THE INTERIOR OF THE EYE.*

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(*With three wood-cuts.*)

THE history of the application of the magnet to extract chips of iron or steel from the eyeball is very old, but only in the last years have the attempts of surgery in that direction been crowned with success.

Fabricius Hildanus has already applied the magnet to the extraction of iron splinters from the cornea, and, as he confesses, according to a suggestion from his wife.[1] Quite the same was the idea of the celebrated Morgagni,[2] who tried (it

* A *short abstract* of this paper was read before the Society of German Surgeons April 9, 1881. It is a critical review of the cases that have hitherto been made known, and, on account of its comprehensiveness and completeness, the author begs to be excused for having, in abstract, reproduced a number of observations published in this and other periodicals.

[1] Fabricii Hildani: Opera observationum et curationum, Francofurti, 1646, centur. v, observat. 21.

"Rusticus quidam * * * cum chalybem apud mercatorem emeret, * * * et proinde frustum contra frustum allideret; scintilla ipsi in illam cornæ partem, ubi iris conspicitur, prosiliit ibidemque membranæ firmiter inhæsit idque non sine dolore maximo. * * * (Post plures dies) venit ad me. * * * Primo instrumentis * * * per aliquot dies tentavi, * * * sed operam et oleum perdidi. En uxor mea remedium longe aptissimum excogitat. Interim enim, dum ego ambabus manibus palpebras aperio, illa magnetem oculo, quam proxime æger id sufferre potuit, admovet. Id quum aliquoties et repetitis vicibus fecissemus, tandem scoria ex oculo nobis omnibus videntibus prosiliit. Postea applicato collyrio anodyno brevi convaluit. * * * Ante operationem omnes anguli lapidis examinandi sunt, ne pars illa quae ferrum repellit oculo adhibeatur."

[2] T. B. Morgagni: De sedibus et causis morborum, Helroduni, 1779, i, p. 225 (Epistol. xiii, §§ 21 and 22). Nisi autem (scoria) per se excidisset, magnetem

is true, in vain) to extract a splinter from a little corneal abscess with the magnet, and recommended it for similar cases. For that purpose the *magnet* is *unsuited*, owing to the great resistance in relation to the smallness of the splinters, and certainly *superfluous* to the surgeon, who will do it much better and easier with a common curved cataract-needle.

The magnet, nevertheless, *has* been used[1] and *is* still used for the extraction of splinters from the corneal surface, principally in some larger foundries, which are supplied, of course, with the strongest electro-magnets.

It is difficult to make out who was the *first* to apply the magnet for chips which had *entered* the cavity of the eyeball. In the ophthalmology of Dr. Karl Himly,[2] Professor in Göttingen, we find the following passage: "You can try to extract, with the aid of a magnet, a piece of iron, having entered the aqueous chamber, if projecting outward, but not sufficiently to be caught with forceps." He quotes a case of Dr. Meyer, of Minden,[3] who succeeded with a magnet bearing thirty pounds in extracting a long narrow piece of steel which had entered hot through the selerotic behind the iris. The following inflammation was cured.

The paper of Mr. Dixon[4] is quoted very often, but seems not to have been read by all who quote it. Mr. Dixon says:

"As the suspending filament (in the vitreous) allowed the for-

rursus experiri in animo erat, firmato per aptum instrumentum oculo, ne moleste adeo cum scoria attraheretur. Vides, ut ex magneticæ attractionis, sicuti vocant, phænomeno in speciem inutili, * * * quae inde existere uti totas interdum possit et ad diagnoscendam morbi causam et ad tollendam. Nihil enim dubii est, quin ejusmodi scoriæ aut inter initia, quum fibræ nondum constrictæ sunt, aut postea, cum laxantur, facile possunt eximi magnetis ope, aut saltem ita demoveri, ut, nisi per se excidant, volsellis queant apprehendi. Neque haec in oculo tantum dico, sed in quacunque cui forte infixæ fuerint parte. * * *

[1] See the quotation of Dr. Snell in the *British Medical Journal* for July 17, 1880. "I applied the loadstone, and immediately the piece of iron flew out" (off the cornea).—Dr. S. Milhes, 1745.

[2] See Die Krankheiten und Missbildungen des menschlichen Auges und deren Heilung von Dr. Karl Himly. Herausgegeben von Dr. E. A. W. Himly, Berlin, 1843, ii, p. 95.—Karl Himly died 1837. His Lectures were edited by his son.

[3] Mediz. Leitung vom Verein für Heilkunde in Preussen, 1842, No. 11. I have read the original, which does not give any more details.

[4] 1858, *Ophth. Hosp. Reports*, i, p. 282.

eign body a certain degree of motion, it was suggested that magnetic attraction might be employed to draw it nearer to the surface. A powerful magnet was tried, but its action on the foreign body, although very decided, was not available; for, if drawn inward, the body became hidden behind the iris, and, if drawn outward, it came into contact with the lens; finally, through a sclerotical section performed with Jäger's lanceolar knife, before and parallel to the equator, Assalini's forceps was introduced, and, after two ineffectual grasps, the chip was caught and drawn out. It weighed a quarter of a grain (*i.e.*, 15 milligrams). The patient could read small print after three months."

On May 18, 1859, a girl, aged fourteen, was brought to St. Mary's Hospital, under the care of Mr. White Cooper.[1] The previous day, whilst standing near her father, who was turning a piece of hardened iron in a lathe, a chip struck her left eye, which had since been in constant pain, though the sight was not materially affected. On examination the chip was seen sticking in the iris, about midway between its upper border and the pupil. The anterior chamber was full and there was no mark of entrance in the cornea. * * * Mr. White Cooper, fearing that difficulty would arise in grasping the smooth metal with forceps, suspended, as it was, in the loose membrane, decided on trying the effect of a magnet. The iris having been brought under the influence of atropine, whereby the foreign body was drawn near the margin of the cornea, the patient was chloroformed and a cataract knife was passed through the cornea opposite the chip, and a sufficient opening made for its escape. A magnet was then applied to the wound, and in an instant the chip leaped from its situation in the eye and attached itself to the magnet. The lids were then closed with adhesive plaster and cold-water dressings applied. No bad symptoms followed and the eye was well in a week.

In 1873 Prof. von Rothmund,[2] of Munich, operated on a case with success. An iron chip had entered through the cornea and its edge reached the anterior capsule of the crystalline, so that extraction seemed impossible without producing cataract. Prof. von Rothmund made use of the enormous magnet of the Munich Polytechnic Institute, combined with it a smaller one (probably an iron armature), touched the cornea, and succeeded in removing the sharp edge of the chip from the capsule and in extracting

[1] *Lancet*, 1859, i, p. 388.

[2] See *Centralblatt f. Augenheilkunde*, 1880, p. 27, and Dr. Hassenstein's inaugural dissertation.

the metal through a linear section. Nevertheless cataract followed, but was cured by solution, with good vision.

Dr. MacKeown,[7-12] of Belfast, has the merit of having cultivated this field of ocular surgery. He ventured to introduce the point of a magnet into the vitreous body, and succeeded in extracting the metal. He used the magnet as an extractor, as a probe, and as a means of diagnosis, when held outside the eye, by the movements impressed on a suspected foreign body. In his opinion the magnet is unnecessary and unsuited for removing foreign bodies from the surface of the cornea; and cases in which the anterior part of the eyeball contains the metal do generally not require the use of the magnet. Dr. MacKeown has observed and published the following cases:

1. A lad, 15 years old, had his right eye wounded by a piece of metal which flew from a hammer. On the following day he could count fingers with the injured eye. There was a wound in the cornea, from the centre to the periphery. The iris was cut at its pupillary margin. No opacity of the lens. Deep in the vitreous body, at the temporal side, there were opacities, one of which, at times, showed a silvery streak at its lower part. Next day the media had become cloudy. Intense pain set in. Dr. Andrews lent to the surgeon a bar-magnet about eight inches long, one inch broad, and about one line thick, and tapering at both extremities to a point. The patient having been etherized, Dr. MacKeown made an incision about two lines and a half from and parallel to the corneal margin; introduced a pair of iridectomy forceps into the vitreous, but failed to touch the metal; then he passed one point of the magnet into the vitreous and directed it backward. The foreign body was directly attached to it, but twice stripped off at the margins of the wound. On the third trial it was extracted. It weighed half a grain. The media cleared rapidly. The lens retained its transparency. The vitreous showed slight filmy opacity. The field of vision was perfect, save a small part on the nasal side. The eye could read No. 2 of Snellen at one foot. After the lapse of some months the patient was found quite well.

[7-12] *British Med. Journal*, 27 June, 1874.
Dublin Journ. of Med. Science, 1876.
British Med. Journal, 24 May, 1878.
Private letters to the author of this paper.

2. A man, aged 30, presented himself in Sept., 1875. A very jagged wound was in the cornea and inner part of the sclerotic. It was a quarter of an inch or more in length. The lens was opaque; the iris, much torn and sticking in the wound, was snipped off; then a magnet was introduced into the vitreous, and detected the metal at once by the click produced. The wound was enlarged, and the metal extracted (150 *mgm.*). Atrophy of the globe followed. Enucleation of the eyeball was urged, but the patient objected.

3. In a case of injury a dark body with bright margins was detected in the vitreous. An assistant held a powerful magnet close to the eye; a quivering movement of the body was caused. The extraction was difficult, but finally successful (20 *mgm.*). Next day the eye was more inflamed, and afterward enucleated.

4. In another case there was a doubtful body in the iris. A magnet was applied close to the cornea, and on moving it in different directions the pupil changed its shape. A peripheral incision was made through the cornea, and the pointed magnet introduced. Immediately the segment of iris containing the foreign body was drawn through the wound, and the operation completed by snipping it off with scissors.

5. A foreign body escaped the iris forceps; the point of a magnet was introduced and the chip extracted.

6. A miller showed, three quarters of an hour after having received an injury, a wound on the sclera near the corneal margin. The magnet was cautiously introduced and the foreign body extracted.

In a letter which Mr. MacKeown kindly addressed to me on July 24, 1878, there is the following sentence: "I am very much astonished that other ophthalmic surgeons have not since that time used the magnet to some extent." And in another letter, on January 2, 1880, he alludes briefly to two cases of the preceding year. I have learned, not without some gratification, that our esteemed Belfast colleague, to whom the profession is so much indebted for this part of ocular surgery, has recently laid aside his pointed bar-magnet in favor of my electro-magnet.

Other cases are related by Mr. MacHardy,[15-16] of London.

[15-16] The *British Med. Journal*, March 26, 1881. See also the ninth volume of the Clinical Society's Transactions.

I. In 1877 he successfully operated on his first case, which was quite similar to that of Dr. v. Rothmund (1873). The operation was performed in the same manner.

II. A blacksmith, aged 53, was seen 24 hours after receiving a blow on the eye by a chip. The eye was greatly inflamed; near the centre of the cornea there was the scar of a recent wound, which was so plugged with soft lymph as to keep back the aqueous humor. There was severe iritis and the pupil was dilated. Atropine, freely used during 24 hours, did not open the pupil. Then placing the north pole of an electro-magnet before the patient's damaged eye, the surgeon closed the galvanic circuit, when the patient immediately exclaimed that the pain of his eye was unbearably augmented. When the magnetic traction had been applied for fifteen minutes in all, a metallic surface could be seen penetrating the iris and becoming hidden in the track of the corneal wound. Five minutes later a projecting point was visible on the surface of the cornea, but on withdrawing the magnet to apply mechanical traction to the fragment, it was observed to immediately recede below the corneal surface. The administration of ether was then commenced. When the patient was fully under the influence of the anæsthetic, the magnet was re-applied and the fragment of metal, measuring 2 by 5 *mm.*, weighing 158 *mgm.*, at once passed out of the eye and fastened itself upon the pole of the magnet. From this time the ocular congestion gradually subsided, and there has been no further pain in the eye, which retains good perception of light and normal tension.

III. 1881.—A bricklayer, aged 30, had his left eye struck by a chip. The next day his vision was not materially impaired; the corneal surface opaque at its centre; the lens transparent; and far behind it a small opacity exhibiting a metallic lustre on focal illumination. During the second 24 hours after the injury the lens had become slightly cloudy. Then having well magnetized the chip by induction[1] through the proximity of the large electro-magnet, the surgeon similarly rendered a sharp lance-pointed cataract needle a permanent magnet. Introducing the point of this magnetized cataract needle eccentrically through the upper and outer quadrant of the cornea, he passed it across the aqueous chamber through the wide pupil, to the anterior surface of the lens, and through the lens in a direct line to the chip.

[1] See later the quotation of Mr. Prout.

After making a slight lateral movement with the point of the needle against the chip, he gently withdrew the needle, to which the chip clung along the whole length of the track, through which the needle had been thrust after it had entered the anterior chamber, but was stripped off at the corneal puncture and fell upon the iris from where it was drawn out through a peripheral corneal puncture made with a non-magnetic, bent, broad needle. It weighed 1.2 milligrams. The lens became totally opaque.

To finish the English literature about the matter, I may allude to a beginning of a history recently published.[17]

George H., aged 17 years, while hammering, March 7, 1881, felt something strike the left eye. He came to the hospital March 23d. Conjunctiva much injected ; cornea free from opacity ; but just below its centre was a transverse wound one eighth of an inch in length ; foreign body within the cataractous crystalline. March 24th : Under methylene the corneal wound was trephined(?), slightly extended at each end, and an unsuccessful attempt made to remove the foreign body by introducing the tapering end of an electro-magnet. March 25th : Under ether iridectomy was performed inferiorly, the flat end of the electro-magnet introduced, and a piece of iron removed, about one tenth of an inch by one fifth of an inch. Inflammation subsided.[1]

I myself[18-22] tried the magnet first in 1875, and borrowed for that purpose an instrument from Dr. Brecht, of Berlin. It was an anchora of the shape of a branch of an iris-forceps, connected with a horseshoe-magnet, which was surrounded with the wire starting from a common bichromate cell.

Case 1.—William L., aged 25, had his right eye struck November 6, 1875, and came to my clinic on Nov. 24th. The right eye could count fingers at a distance of eight feet. There was injection, artificial mydriasis, partial opacity of the anterior and

[17] The *British Med. Journ.*, April 16, 1881. (Dr. Brown and Mr. Appleyard.)

[1] The electro-magnet was of Mr. Hess, Berlin.

[18-22] See *Archiv. für Ophthalmologie*, xxii, 3, 157, a, 1876.
Berl. Klin. Wochenschrift, 1879.
Centralblatt f. pratitische Augenheilk., 1879 and 1880.
Archiv für Chirurgie (B. v. Langenbeck), 1881 ; *Centralblatt f. Chirurg.*, 1881.

the posterior cortex of the lens, and, visible to the observer's naked eye, a bright splinter about 2 *mm.* long and 1 *mm.* broad, behind and a little above the posterior pole of the crystalline, attached to dense films in the transparent vitreous. I removed the lens by inferior corneal flap section, but immediately clear vitreous escaped. I introduced the electric branch—in vain ; the spoon—in vain. The eye was bandaged for a few minutes, then the bandage removed. A bright point became visible behind the lower edge of the pupil. A pair of capsule forceps was introduced, with which at the first grasp the foreign body was drawn out. The operation had lasted about ten minutes ; the loss of vitreous was not very considerable ; the corneal wound healed well, but a decided irido-cyclitis with hypopyon followed. On December 12, 1875, I performed excision of the eyeball.

I will not decide whether the instrument was unfit or the case unfavorable, owing to the adhesions of the foreign body, or the operator too timid in the first application of a new instrument. Surely to-day I would prefer to operate on such a case through a sclerotical section.

From that time I studied more particularly the effect of the magnet, and liked to demonstrate it regularly to the students of my class on the eye of living rabbits,[1] into which I had introduced iron splinters before.

The instrument which I use, and which has been adopted by several oculists (I quote MacKeown, Knapp, Samelsohn, Wolfe, Sattler), was manufactured in 1877 by Mr. P. Dörffel, of Berlin, according to my plan, and gradually improved.[2] It is simple, handy, and powerful enough for all our purposes. The electromotory force is supplied from an ordinary zinc-carbon cell, filled with a solution of chromic acid, which is in the possession or within the reach of every surgeon in every country. From the cell two wires start and go to the spiral,[3] which is wound round a cylindrical nucleus of pure soft iron, tapering at each end into a small curved

[1] Upon which I drill them in the performance of the common eye operations.

[2] Mr. Macdonald MacHardy, in his able paper above quoted, is very anxious not to be *hypercritical* about my apparatus. I believe that the best *anticriticism* is *success*.

[3] The copper wire, of 0.6 *mm.* thickness, forms 9,500 turns ; the resistance is equal to four units of Siemens.

branch, which is to be introduced into the eyeball. One branch is about $\frac{3}{4}$ *mm.*, the other about $\frac{1}{4}$ *mm.* thick. The thinner branch should be used for the removal of particles within the capsule of the crystalline, and in the vitreous if extensive movements are required. With this thin-

FIG. I.—SHOWING THE AUTHOR'S ELECTRO-MAGNET, CONSTRUCTED 1877.

ner branch the electro-magnet bears more than 50 grammes, *i. e.*, much more than a thousand-fold the weight of the splinters commonly found within the eyeball; it attracts iron or steel splinters of 1 to 5 *mm.* in length from a distance of five and more *mm.*, even if they are immersed in a solu-

tion of gum or albumen or in the vitreous humor. But if the resistance is more considerable, the same splinter is no longer moved by the magnet.

Lately some authors insist upon the poles of the magnet being carefully chosen. They say: An iron or particularly a steel chip within the eyeball may be magnetic, and can be repelled instead of attracted, if, for instance, to its north pole the north pole of the extractor magnet is approached. This idea is by no means new. It was suggested, as we have seen, by the wife of Fabricius Hildanus, but it is a mere delusion.

Take a little piece of hammered iron, perhaps extracted from within the eyeball, or a common new steel pen, or a piece of it, and magnetize (attract) it with an electro-magnet, then approach the other pole of the magnet, and you see the piece attracted with about the same ease as before. (In this experiment I used a magnet with both tips of equal thickness.)

After these short preliminary remarks I proceed to the practical indications of the electro-magnet in ocular surgery.

According to the opinion of MacKeown and others, with whom I perfectly agree, the magnet is both unsuitable and unnecessary for foreign bodies within the superficial layers of the cornea.

If the chip is within the *aqueous chamber*, you may attack it with the common instruments (hook, spoon, iris-forceps), because it is generally visible during all the acts of the operation; and you can convince yourself by easy experiments on the eyes of living narcotized rabbits, that when the aqueous humor has escaped and the chip is held between the cornea and the iris, it is almost impossible to extract it with the magnet, but easy with a pair of forceps. As a rule, a piece of iris must be cut off; either the splinter has been lodged from the beginning in the iris tissue, or was connected with the posterior layers of the cornea, and fell down upon the iris after the corneal section. But *by no means is it unnecessary to have the magnet at hand for such operations.* First, you can easily magnetize your forceps or

hook, so that the first grasp may be surer and the foreign body not be pushed away by the instrument. Secondly, the foreign body may disappear from view during the operation, and remain within the reach of the magnet, but of no other instrument.

CASE 2.—On the 23d of October, 1879, I saw a stonecutter whose right eye had several years previously been severely damaged, and now hurt by a fresh injury twenty hours before. There was upon the very bottom of the aqueous chamber a large chip of iron; old cataract, fresh inflammation. I immediately performed a flap section at the corneal margin, including about a quarter of it; introduced a forceps, but could not grasp the foreign body, which immediately sunk into the depth,—I believe, because the zonula was defective owing to the old injury. The magnet was introduced, plunged into the anterior part of the vitreous, and immediately an iron chip of 20 *mm.* weight extracted. The wound was healed on the following day, the patient discharged after a fortnight, the eye being free from all irritation.

That a strong magnet can withdraw iron splinters reaching from the anterior *capsule of the lens* to the posterior surface of the cornea is proved by the cases of Rothmund and MacHardy. Unhappily in both cases cataract followed. Splinters *within the crystalline* may be very small and yet produce cataract. If there is no entrance scar in the cornea, and the foreign body, as may happen, is not visible, the diagnosis is very difficult,—only based upon the occupation and age of the patient, the perfect transparency of the other eye, and perhaps a faint trace of rust color in the cataract.

I found, after extraction, such a cataract, including a splinter of less than a milligram. Generally these chips are larger and can be caught with the forceps, which I introduced, immediately after the corneal section, in two successful cases. But I must allude here to the cases operated on by Dr. Samelsohn and Dr. Snell with the electro-magnet, and quoted further on.

You may notice that, after all, the magnet is not indispensable, *though very useful*, for the removal of foreign

bodies lodged between the posterior surface of the cornea and the posterior capsule of the lens. It celebrates real triumphs when the foreign body is found *within the vitreous*, from which it generally cannot be extracted with the common instruments without severe damage to the eyeball. During the last two years I have had four cases of chips of iron in the vitreous under my care. They were operated with the magnet through *sclerotical sections*, and will be here recorded.

I venture to state that the operation itself is quite safe, if you perform the sclerotical section in a *meridional direction* and cover it finally with a *conjunctival flap*, and if you succeed in extracting the foreign body after a short time and without the aid of forceps and spoon. Of course, such an operation is not to be compared as to security with a cataract-extraction. If we succeed in saving only a certain number of these eyeballs, which in the spontaneous course of disease are doomed to destruction,—even in several cases with sympathetic inflammation of their fellows,—we may feel highly gratified.

CASE 3.—*Extraction of an iron chip from the vitreous through sclerotical section by aid of an electro-magnet. Perfect recovery. Result observed during twenty months.*

On the 11th of September, half past three p. m., Edward Kluth (from Putlitz) came to me, six hours before, the right eye had been injured in hammering. The eyeball was almost free from irritation. Above the upper corneal edge (about 1½ *mm.*) there was a sclerotical wound, horizontal, gaping, 2½ *mm.* long. Clear vitreous between the margins of the wound. The cornea slightly folded in a vertical direction; the aqueous chamber contained some blood. The eye was bandaged, the patient put to bed. In the evening vision was better, the wound closed, the cornea of normal convexity, the aqueous transparent. With the ophthalmoscope I noticed a normal red reflex. A film was visible, starting from the wound and proceeding downward and backward. When the patient looked downward I saw the iron chip behind the crystalline in the vitreous; the foreign body was dark, irregular, with sharp and shining edges. Optic nerve and retina nor-

mal. The next morning I put the patient under chloroform, made a curved conjunctival flap between the external and inferior recti, turned it over to the temporal side, and carefully stopped the bleeding. Then my assistant, Dr. Vogler,[1] grasping with a pair of forceps a conjunctival fold in the horizontal meridian, near the nasal edge of the cornea, turned the eyeball strongly upward and inward. Then I made a meridional incision of 4 *mm.* into the coats of the eye. As gentle pressure upon one lip of the wound did not expel the foreign body, I introduced the curved edge of my electro-magnet, directed to the nasal side (its concavity turned against the sclera). No foreign body was brought forward. The section was then extended to double its size in the direction toward the equator with a pair of scissors, the magnet introduced deeper, so that its point reached the lower part of the equator. No click audible. But carefully extracting the instrument, meanwhile the convexity exerted a gentle pressure upon the lateral margin of the wound, to avoid stripping off the foreign body, I saw the dark chip attached to the magnet, and easily extracted it. The wound was closed by two conjunctival sutures, and the patient put to bed. The piece of iron was 3 *mm.* long, 2 *mm.* broad, 1 *mm.* thick, dark, not rusty, with sharp and irregular edges; it weighed about 20 milligrams.

The wound healed without any reaction. No pain after awaking from the narcosis. On the day after operation the eyeball was free from irritation, only its tension diminished ($-T_2$), the cornea slightly folded, the pupil narrow. On the second day (14th Sept.) the same condition. A drop of atropine solution was put into the conjunctiva. On the third day the eye could easily recognize the time upon an ordinary watch. In the evening the atropine began to act. A cautious examination with the ophthalmoscope showed that the media were clear, and the anterior edge of the sclerotical wound well visible in the fundus.

On the fourth day the stitches were removed. About a fortnight after the operation a careful examination was made. The eye-ball was free from irritation, the entrance of the foreign body cicatrized, the region of the sclerotical section somewhat prominent, owing to the succulency of the conjunctival flap. Media clear, but a fine film visible in the vitreous. Disc and surrounding retina normal. The alteration in the fundus caused by the surgical interference began about 5—6 P,[2] or 7—9 milli-

[1] A most promising young man, who died in 1880.

[2] P, means the breadth of the disc, about 1½ *mm.*

metres, in an oblique direction outward and downward, from the margin of the disc. There was a large sharply limited section-like area, the anterior (equatorial) edge of which could not be reached with the ophthalmoscope. Within this area, upon which the retinal vessels run uncovered and unchanged, the normal red fundus was discolored, whitish, sprinkled with many little dark points, showing some abruptly appearing choroidal vessels. Within this area, about 4 P from its edge (*i. e.*, about 12–14 *mm.*

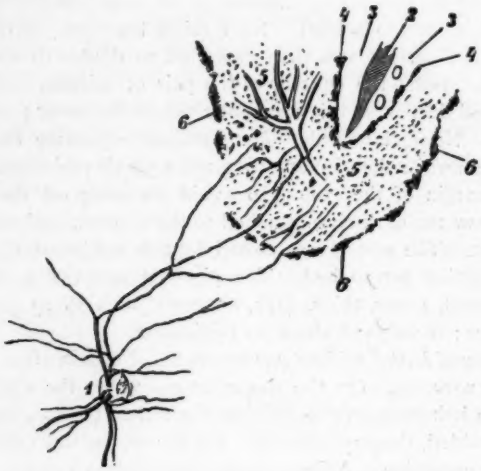

FIG. II.—OPHTHALMOSCOPIC APPEARANCE OF THE THIRD CASE TWO WEEKS AFTER THE OPERATION. INVERTED IMAGE.

1. Disc. 2. Grayish scar in the sclera (sclerotical section). 3. The part of the sclera uncovered by choroid, with two small blood spots. 4. Edge of the retracted choroid. 5. Large area deprived of pigment, with visible choroidal vessels. 6. Its sharply defined and pigmented margin.

from the disc), there appeared the point of a beak-shaped figure, surrounded with dark pigment, and limiting that part of the fundus in which the sclerotic was not covered by the choroid. Within this whitish figure, I saw a similar one, on a reduced scale, and of grayish color, *i. e.*, the sclerotical cicatrix.

The eye could read the smallest print (Sn. $1\frac{1}{2}$ at 12″). The field was normal, except a moderate defect in the inner upper quadrant, corresponding to the optic-nerve fibres cut during the

operation. I discharged the patient in four weeks, and presented him to the Berlin Medical Society six weeks, and at the Congress of German Surgeons, 20 months after the operation. The eye was then as before; reading the smallest print, with normal field, except that moderate defect; without any turbidity of the media and without any detachment of the retina. The ophthalmoscopic appearance as above described, only the scar of the sclerotical section less sharply limited.

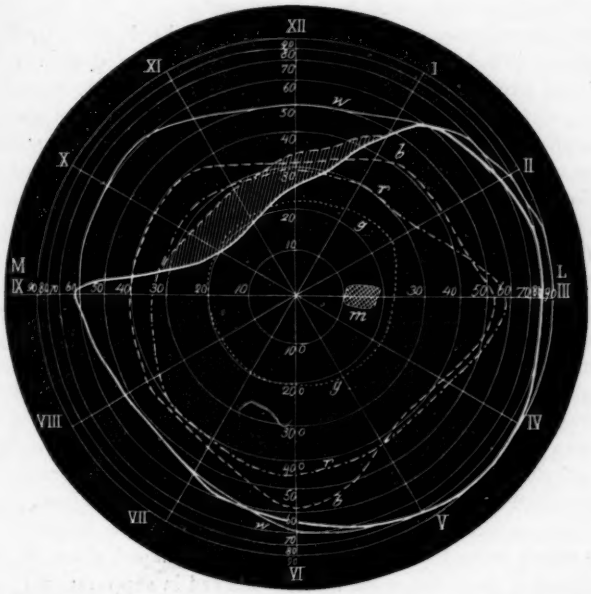

FIG. 3.—SHOWING THE FIELD OF VISION OF THE THIRD CASE; RIGHT EYE.

[Orthographic projection of the field. The centre is the point of fixation; *m*. Mariotte's blind spot, *M*. medial (nasal) side, *L*. lateral (temporal) side. The fine curves give the normal extent; *w* for white, *b* for blue, *r* for red, *g* for green. The thicker curve gives the limit of the field in our case; the shaded area marks the indistinct perception.]

CASE 4.—Ernest Lyon, 15 years old, came to my clinic on the 21st April, 1880. Eight days previously, a piece of metal flew from a hammer into his right eye. There was now the appearance of acute iritis; an intense red and violet injection surrounding the cornea; numerous posterior synechiæ, a slight hypopyon.

In the scleral conjunctiva, some *mm.* outward from the corneal periphery, in the horizontal meridian, I detected the point of entrance (less than 2 *mm.*) of the foreign body, filled with mucoid tissue, viz. changed vitreous. Disc visible; in the retina a bluish shining body, which I believed to be the incapsulated metal. The eye could recognize the time on a watch and count fingers eccentrically, except upward.

On the 23d April, 1880, I performed the operation according to the above-described method; but unhappily I did not succeed in extracting metal, or at least I did not see it. But the irritation passed away entirely. After six weeks I discharged the patient. To-day, April 9, 1881, a year after the operation, the injured eyeball is quite well, without any irritation, normal in its anterior parts, except the faint traces of the scleral section, and counts fingers at a distance of four feet. With the ophthalmoscope large, dense, bluish membranes are seen in front of the retina, principally downward.

Case 5.—On the 26th of March, 1880, 6 o'clock P.M., Henry Müller, of Berlin, 18 years old, came to me on account of an injury which he had received two days before, when chiseling steel with steel. A drop of atropine had been put into his eye. Left eye normal, right almost blind; at least it could not count the fingers in the nearest proximity. The conjunctiva much injected, a blood spot of 2 *mm.* in diameter between the edge of the cornea and the equator, about 45° downward and inward, indicating the entrance of the foreign body, no other irregularity of the eyeball being visible. There was a decided hypopyon, some spongy exudation in the aqueous chamber, and in the midst of the widely dilated and regular pupil, a coin-shaped thick exudation,—very much like what I have observed in suppurative (principally metastatic or embolic) choroiditis. The crystalline was clear, the vitreous turbid, the foreign body not visible with the ophthalmoscope, not even on the following morning when I threw sunlight into the pupil, which only showed a marked purulent appearance of the whole vitreous. Immediately I proceeded to the operation, assisted by Dr. Fedor Krause, of Berlin, and Dr. Schrank, of Munich.

From the entrance point and our general experience on such cases I had to infer that the chip had entered the sclerotic inward and downward, flown through the vitreous, reached the fundus, and

fallen down, lying now in the vitreous either directly downward, or outward and downward. Hence, under deep narcosis, in the space between the right external and inferior muscles, a conjunctival flap was cut and turned toward the temples, and a meridional section of about 7–8 millimetres in length was made between ciliary body and equator. Vitreous did not escape, but appeared of yellowish color, in the wound. I introduced the curved point of my electro-magnet in various directions and withdrew it. After the third trial I saw a splinter of iron attached to the magnet, not to its very point, but some *mm.* further. The chip was free from rust, 2 *mm.* long, 1 *mm.* broad, very thin, and weighed only 3½ milligrams. It was one of the smallest foreign bodies ever extracted from the interior of the eye with the magnet.

The conjunctiva was stitched over the scleral wound and the eye bandaged.

On the following day (March 28th) the eye was painless, but there was a marked chemosis and a continuous exudation covered both iris and pupil. After two further days the chemosis and exudation had almost disappeared, The vitreous was somewhat translucid in its upper part. The eye could distinguish light from darkness. The acute inflammation decreased more and more; but the hope that vision might be restored, even partially, was not realized. Without any marked symptoms of severe inflammation, a dense yellowish infiltration of the vitreous grew nearer and nearer to the crystalline; pain set in in the form of headache of the same (right) side; the eyeball was soft ($-T_2$) and tender to the touch in ciliary region near the incision; every trace of luminous perception ceased; the danger of sympathetic affection of the left eye increased gradually. Three weeks after the operation, as enucleation was refused, I performed optico-ciliary neurotomy in the usual manner, from the nasal side. Perfect insensibillty of the eyeball was obtained, mobility normal, the cornea remained clear, showing the bright brass-yellow reflex from the vitreous. Six weeks after admission the patient was discharged with a blind but painless and moderately shrunken eyeball. Cornea perfectly clear and perfectly insensitive.

Three months after neurotomy a slight but decided tenderness by pressure upon the ciliary body returned. I immediately proposed excision, and performed the operation as the patient then was better prepared to listen to advice.

What I had presumed from the beginning is now proved by a lamentable experience of Professor Leber,—that optico-ciliary neurotomy does not at all exclude the true sympathetic ophthalmia.

Though the result of the interference was not at all satisfactory either for the patient or for the surgeon, I demonstrated the interesting fact, that such a small piece of iron, not visible by reflected sunlight, was easily extracted with the magnet, and that a decided panophthalmitis was stopped by the operation. I believe that in similar cases the same operation should be performed. The prognosis will be the better the sooner the extraction of the metal can be undertaken. It is very rare for such little pieces to cause panophthalmitis so early as the second day after the injury.

To show that the common electro-magnet can easily extract metal from an abscess of the vitreous, I shall record here an interesting case in which, it is true, the magnet could only be applied to the enucleated eyeball.

Case 6.—December 14, 1879, H. K., æt. 31, consulted me five weeks after a fragment of a chisel had struck his left eye. Meanwhile he had been treated, by an ophthalmic surgeon, with mercurial ointment. At the first glance it was evident that a foreign body was in the globe. A white and sharply-defined angular scar, 1½ *mm.* long, was visible at the extreme upper edge of the transparent cornea. Directly behind it was a wrinkled scar in the iris. The anterior portion of the lens, directly behind the capsule, showed a small yellowish opacity, and the distinctly suffused posterior layers adjoined a purulent infiltration of the vitreous. Pericorneal injection was also present, and the ciliary region extremely sensitive. The danger of sympathetic irritation was imminent. I, of course, proposed and performed an immediate enucleation. The patient did well. The globe was opened in the horizontal direction. In the lower half the vitreous was detached from the retina in the shape of a funnel, and its apex attached to the swollen papilla. A flat and folded detachment of the retina extended from the papilla downward and forward into an abscess as large as a pea in the centre of the otherwise transparent vitreous. This abscess was directly continuous with a purulent infiltration

of the posterior lamellæ of the lens, and evidently concealed the foreign body. In order to remove the foreign body without destroying the specimen, the abscess was opened with two anatomical needles, and a metallic splinter easily removed from the abscess with one of our electro-magnets. The ciliary body was very thick, the iris infiltrated. No doubt the metal *could* have been extracted through a scleral section in a period prior to the danger of sympathy.

Finally, for completing the series of my observations, as I do not intend to conceal the *bad results*, I may allude briefly to the fourth and last case of selerotical section.

Case 7.—Otto Wagner, of Berlin, æt. 44, had his right eye struck on hammering, July 12, 1880. There was a wound in the sclera, 3 *mm.* laterally from the corneal edge, and 3 *mm.* long; dense bloody opacities in the vitreous and on the posterior surface of the crystalline; no foreign body visible. The wound healed well; the vitreous cleared up; the eye could see Sn CC at fifteen feet. The patient was discharged August 14, 1880. The vision decreased slowly; fingers counted at one foot and a half September 19, 1880; at one foot November 11, 1880. Membranes visible downward in the vitreous, with a bright reflex; slight but continuous irritation, so that the patient was unable to work; operation as above described November 27, 1880, but the foreign body did not escape, either with the magnet or with the spoon; forceps and hook repeatedly introduced; inflammation followed, with infiltration of the vitreous and chemosis. The latter having subsided, enucleation was performed December 21, 1880. The patient does well, though having but his right eye. The anatomical examination showed that the *sclerotical section had healed well.* There was neuritis optica of the highest degree; some retinitis; choroid not much changed; abscess in the vitreous body, and, in its deepest part, the splinter, 6 *mm.* long, 3 *mm.* broad, rusty, but easily attracted with our smallest electro-magnet.

A very important procedure is the *probing of fresh wounds with the electro-magnet* in cases where we are sure that iron or steel is within the eyeball. This conviction depends naturally not upon what the patient says, but

what the surgeon sees. The event of the probing is very different, according to the period elapsed since the infliction of the injury, and the condition of the case.

Case 8.—Charles Goede, æt. 39, from a suburb of Berlin, had his left eye struck May 12, 1881, 3 o'clock P. M., on riveting. He came to me three hours later. The globe was a little collapsed. A penetrating wound, about 7 *mm.* long, passed from the centre of the cornea straight down to the margin of the sclerotic. In the outer chamber no aqueous, but lymph and blood; iris cut through twice, first downward and secondly outward. The condition of the lens could not be well recognized. Immediately I proceeded to probing. The patient sitting upon a chair, I opened his lids with my left hand and introduced the curved tip of the magnet with the right hand, first to the temporal side, into the lateral cleft of the iris, but without any result; then I cautiously thrust the instrument in the vertical cleft of the iris to the bottom of the anterior chamber, and when, feeling no resistance, I slowly pushed it deeper, a click was heard by myself and by the attendant, who held the head of the patient. The attracted iron was gently drawn to the corneal wound, stripped off twice, finally deposited between the lips of the gaping wound, caught with a fixing forceps, and slowly extracted. The operation was accompanied by intense pain, and followed by moderate bleeding. The eye was bandaged, the patient put to bed.

The piece of iron was the largest, perhaps, ever extracted from the cavities of the eye with preservation of the eyeball; it had the shape of a sickle, was more than 15 millimetres long, 2½ *mm.* broad, not very thick, but sharp on the concave side, and weighed 240 *mgrm.*, viz., 8–12 times the common weight of iron splinters extracted from the vitreous or aqueous with success. It must have been situated behind the lens in the vitreous. The patient, who had strongly denied the presence of iron within his eye, was greatly astonished when I showed him this dreadful piece, and believed that his eye was lost,—and I must confess that I had almost the same opinion. Nevertheless, I treated him carefully as if the eyeball was to be preserved. A full dose of hydrate of chloral procured good rest during half of the night. Next morning I found, to my great surprise and delight, that the eyeball was free from irritation. Pericorneal injection slight; wound healed; the iris was attached to its upper half, and a mucous film, viz., changed

vitreous, was in its lower; lateral quadrant of the cornea hazy, perhaps by the mechanical action of the magnet; pupil narrow, not to be illuminated, filled with lymph; iris partially covered with blood, partially free, but not much inflamed; free use of atropia; bandaging of the eyeball.

The second night was good without any hypnotic remedy. On the third morning (May 14th) no swelling of the lids or conjunctiva bulbi; pupil narrow, slightly irregular, but partially (to the nasal side) retracted from the lymph covering the crystalline; the latter was opaque of course, but not decidedly dislocated. Probably the foreign body on entering the eyeball had first cut through the iris, then the zonula in the lower part (perhaps the lower edge of the lens itself), and had sunk into the vitreous, penetrating with its smaller side, and was extracted with the magnet on about the same way and in the same position. Perception of light and projection satisfactory.

Pain set in only in the night from the 15th to the 16th of May, but did not return, as the eyeball was then freed from the bandage; the use of atropia was given up two days later.

On the 26th of May, a fortnight after the injury, the following condition was recorded: no spontaneous pain at all, but some tenderness on pressure upon the ciliary region; tension a little diminished (—T ½ to 1); size and shape of the eyeball normal; no swelling of the lids or the conjunctiva, but some injection around the cornea; the cloudiness in its lateral part less pronounced; wound well healed, but the scar forms a larger and a little depressed line, and is connected with lymph starting from the iris. The latter is cut through twice, viz., on the lateral side and downward, beginning from the sphincter; iris tissue not degenerated; pupil of moderate size, a little irregular; lens opaque, but neither swollen nor dislocated; the lateral part (⅔) of the pupil covered with a thin membrane of bloody exudation; projection slow but sure.

The final result was, after loss of perception of light and return of pain, enucleation of the eyeball June 6, 1881. It is clear by the severity of such injuries, that enucleation sometimes is only postponed but not prevented by the magnet operation.

Case 9.—Henry Irrganz, æt. 38, had his left eye struck while working at a large boiler, on October 1, 1880, at 10.30 A.M., at Tegel, near Berlin.

A large gaping wound of the lower half of the cornea, a corre-

sponding cleft of the iris, and cataract were visible. The electro-magnet was immediately introduced thrice, but in vain; only blood and a little crystalline matter came out. Yet the presence of an iron chip within the eyeball had to be assumed. A severe painful inflammation (iridocyclitis) followed with exudation upon the iris and in the pupil. The inflammation subsided, but the perception of light faded away, and the cyclitic pain remained, so that I was compelled to perform enucleation, October 16, 1880. The patient's other eye does well.

The enucleated eyeball, examined Oct. 29, 1880, contained a large sharp-edged splinter of iron in the vitreous downward, very near to the ciliary region, where it was *firmly embedded in the coats of the eye*, so that extraction with the magnet, of course, was impossible. It can easily be recognized that the foreign body had flown through lens and vitreous to the fundus, had rebounded and fallen down to the ciliary region. The lower part of the chamber was wanting, the upper preserved; here the iris was covered with lymph. The lens was broken up and yellowish, viz., infiltrated with pus. The vitreous was more consistent than usual, yellowish, and detached from the retina. At one point very near the disc the vitreous was attached to the retina, which there was thickened and suffused with blood. Papilla and surrounding retina decidedly swollen. Ciliary body enormously thickened, and, together with the choroid, detached from the sclera up to the equatorial region,

Case 10.—A workman of the Royal Artillery Foundry of Spandau, was admitted Feb. 16, 1880. On the morning of the same day a large piece of iron had struck his right eye. There was a jagged horizontal wound about 8 *mm.* long in the cornea and 5 *mm.* in the adjoining medial part of the sclerotic. A piece of uvea protruded from the wound. The interior of the eye was entirely filled with blood. The patient asserted, as patients generally do, that metal had only *flown against the eyeball*, but not entered it. The eye was bandaged, the patient put to bed. Next morning, marked chemosis. The protruding piece of uvea was cut off, the electro-magnet introduced, but only dark blood escaped. No suppuration followed; the chemosis decreased, the pain subsided. The eye was absolutely blind and extremely tender to the touch in the ciliary region; the region of the wound was depressed, the chamber dark with blood. A preventive operation was necessary, neurotomia decided on (March 2, 1880). As the optic nerve had to

be divided with scissors, an unusual resistance compelled me to introduce a squint hook as a probe, with which I felt and heard the presence of a foreign body, and completed the enucleation. The patient's other eye does well.

Two points of iron projected,—the one between sheath and substance of the optic nerve, the other on its medial side, both forming one end of a large splinter of iron ; its bulk was in the vitreous chamber, and the other was firmly embedded in the equatorial part of the sclerotic. The thickness of the piece of iron was from 2 to 3 *mm.*, its length between 8 and 10 *mm.* It is clear, of course, that such a piece could not follow the magnet.

The records of several cases, and a few theoretical papers relative to the use of the magnet in the extraction of iron splinters from within the eyeball, some referring to my third case, are to be found in the German and American literature of the last twenty months.

A young locksmith[1] had his left eye injured Feb., 1877. There was inflammation for several weeks, then the pain subsided. Dr. Burgl found in Nov., 1878, a linear scar at the upper edge of the cornea, behind it an oval hole, 2 *mm.* long, in the iris. The iris had undergone a brownish discoloration; the pupil was normal; the eye read common print. S = $\frac{1}{1}$, field normal, except a large movable scotoma. Having dilated the pupil Dr. Burgl found in the vitreous some floating bodies and a bright splinter of metal suspended by films to the superior wall of the eyeball and oscillating with the movements of the globe.

Dismissed from the army, the patient pursued his trade. After a few weeks he returned with lachrymation, photophobia, injection around the cornea, pain, S = $\frac{1}{20}$, the foreign body lying at the bottom of the eye, close behind the ciliary processes. Conjunctivitis of the other eye. Enucleation refused. The patient did not return before Feb. 9, 1880. Right eye with normal vision and fundus. Left eye injected, painful, with synechiæ, opacities of the vitreous, the splinter lying in the old place, but was movable. Feb. 19th, operation according to Hirschberg's method, under deep narcosis, with an electro-magnet made for the purpose. The wound healed well, vision as before operation. The splinter weighed 13 milligrams. Concerning final result of the case the

[1] *Berliner Klin. Wochenschrift*, 1880, No. 44 (Dr. Burgl).

author wrote me kindly that the following condition of the eyes was present a year after operation:

Right eye normal. Left eye of normal size and shape, free from irritation, able to distinguish light and shadow; pupil grayish-green, vitreous fluid with floating opacities.

It is very remarkable that the piece could be removed so long after its entrance,—but, of course, after having spontaneously been loosened from its dense attachments.

On Aug. 20, 1880,[1] a smith had his right eye struck by a piece of a steel chisel. The next day at noon dimness of sight and pain. The 22d Aug., 1880, Dr. Samelsohn found a deep injection around the cornea, marked chemosis, hypopyon, the ciliary body very tender on pressure. In the horizontal meridian of the cornea there was a recently closed wound of 7 *mm.* in length, beginning about 1½ *mm.* from the lateral margin. The iris was attached to a wound of the anterior capsule running transversely through the pupillar region. Fingers at one foot, projection normal. Foreign body not visible. Without narcosis immediately Dr. Hirschberg's electro-magnet was introduced through the wounds of the cornea and the capsule into the lens, and a splinter of 6 *mm.* in length and 2 *mm.* in breadth easily extracted. Next morning all symptoms of cyclitis had subsided, the traumatic cataract took the usual course. Concerning the final result, Dr. Samelsohn kindly wrote me that the patient, after extraction of the nucleus, has acquired V = ½ with the injured eye, and does very well at present. Dr. Samelsohn further had a second case, which was very interesting, but not so successful. (See *Centralblatt f. Augenheilkunde*, June, 1881.) There was a corneal wound, cataract, severe inflammation, the chip lying in the deeper parts of the fundus, a day after the injury of the right eye of a smith, aged 29. Operation as described in Dr. Hirschberg's third case, but the foreign body could not be removed with the magnet. The pain increased. Two days later enucleation was performed and the splinter found very near the sclerotical section, but firmly embedded between retina and choroid.

Richard Düllner,[2] æt. 16, had his left eye injured Dec. 10, 1879. Dr. Fränkel found a wound in the lower and lateral quad-

[1] Dr. Samelsohn, of Cologne, *Berlin. Klin. Wochenschrift*, 1880, No. 44.

[2] Dr. Fränkel, Chemnitz, in the *Centralbl. f. Augenheilkunde*, 1880, page 37. This is the only German case quoted by Dr. Macdonald MacHardy.

rant, 6 *mm.* long, running through the corneo-scleral edge. No foreign body, but only a small clot of blood visible behind the wound. Lens transparent. The prolapse of the iris was snipped off, the eye bandaged and carefully watched. No pain, but increasing opacities of the vitreous and a beginning detachment of the retina outward and downward. Jan. 2, 1880, Dr. Fränkel tried to move the supposed iron splinter with Janin's magnet in vain; but on the next day he could *see* the large splinter, which lay a little outward from the vertical meridian, near the retina, and was movable. The following day, under deep narcosis, the eyeball was opened by a sclerotical section of 10 *mm.* in length, and Janin's magnet passed along the wound, which was held slightly open. When the magnet was brought near the posterior edge of the wound the foreign body suddenly attached itself to it. The wound healed well. Feb. 6, 1880: Behind the scar from the injury the cleft of the iris, 4 *mm.* broad, is visible. With the ophthalmoscope a whitish scar through the ciliary body, and filmy opacities in the vitreous, are observed; no detachment of the retina; the sclerotical section is somewhat depressed. $S = \frac{6}{15}$.

The author adds: I have used Janin's permanent magnet, composed of steel strips bent in the shape of a horseshoe, and united at the poles by steel shoes, "in want of a Hirschberg's electro-magnet," which is more convenient because it can be *introduced*. The splinter was 6 *mm.* long, and weighed 40 milligrams.

Concerning the final result, I received on May 28, 1881, a letter from the author, stating "that in May, 1880, there was a central detachment of the retina which later disappeared spontaneously; Sept., 1880, no detachment, but an area of atrophy of pigment; $S = \frac{1}{2}$; *no irritation.*"

A man, aged 56, had his left eye struck on Sept. 14, 1880,[31 32] on hoeing vines. Six days later Dr. Knies found the eye injected, a fine scar at the lower edge of the cornea, some synechiæ, some lymph in the pupil, and hypopyon. Lens transparent, no foreign body visible. On the next morning the eye was exposed for five minutes to the action of an electro-magnet bearing 50 pounds, but without any visible effect. Now the largest electro-magnet of the Zurich Physical Institution was made ready,

[31-32] Dr. Knies, of Zurich, *Klin. Monatsbl. f. Aug.*, 1881, Januarheft.

the electricity being supplied by a Gramme machine of 1½ horse-power. The lower margin of the cornea was approached to the edge of the iron nucleus to a distance of half a millimetre. The moment the electric current was closed, the patient felt a sharp pain. Immediately a blood spot was visible above the hypopyon, about 4 *mm.* laterally from the scar and a little higher the foreign body appeared as a dark point in the pus. The eye was exposed to the electro-magnet five minutes longer; the current repeatedly closed and opened. Then the patient returned on foot to the neighboring eye hospital. The narcosis of the old drinker was very difficult and incomplete still after 1 hour and a quarter. With a Beer's knife a section was made on the lower edge of the cornea, about 7 *mm.* long; the hypopyon liberated, but not the foreign body; then the wound enlarged with scissors, and finally the chips extracted with iris forceps, not by grasps, but by pushing. Then a piece of iris was cut off. The wound healed well, but a partial cataract was seen at the place of the operation. Vision, $\frac{6}{9}$.

The author, of course, prefers, if possible, the operation from the anterior chamber. He has tried the same method twice, but in vain; in one case enucleation was performed on the same day, owing to the imminence of panophthalmitis; in the other, the eyeball, free from irritation, with cataracta traumatica, was left alone. Very seldom, he says, such a powerful apparatus is within the reach of the surgeon.

I am not quite sure that in the case above related the iron had been in the vitreous, because the vitreous before the operation seemed to be clear, and the pupil was drawn downward (nach unten verzogen). The foreign body could have lain in the depth of the anterior chamber. A simple opening, the introduction of the curved tip of the common electro-magnet, might have sufficed, and would certainly have been useful, even after the use of that enormous electro-magnet, in the definitive extraction of the splinter, because fragments of metal, as a rule, cannot easily be grasped with iris forceps.

A case of amputation of the globe, after failure of extraction with the magnet, is related in the *Klin. Monatsbl. f. Augenheilkunde.*[34]

[34] 1881, Januar, page 28.

Professor Hippel[35] tried in vain Hirschberg's electro-magnet for a piece of iron within the vitreous, and after enucleation found it near the disc. Dr. H. Pagenstecher[36] had phthisis bulbi after extraction of a chip of iron from the vitreous, and added some experiments on rabbits. Dr. Rheindorf[37a] had the same result.

Dr. Henry Oppenheimer,[37] of New York, saw (three days after an injury) in the left eye of a smith a little sclerotical wound near the corneal edge, and some bloody opacities in the vitreous; dilated (under narcosis) the wound, introduced the magnet thrice in vain, but finally found the foreign body within the wound. Two months after extraction S=$\frac{10}{200}$, field contracted concentrically.

Dr. H. Knapp[38] published the following case: May 19, 1880, a machinist, æt. 30, came stating that five days previously, while striking one hammer with another, he felt that something hurt his left eye. Inflammation set in the second day, increased steadily and took away his sight. S=$\frac{1}{8}$, F complete; +T?; pronounced episcleral injection with moderate chemosis; hypopyon of 3 *mm.* in height; the pupil somewhat dilated with atropine, adherent at its inner part; the iris dirty greenish. In the inner segment of the cornea, in the horizontal meridian, about midway between corneal centre and periphery, there was a small irregular opacity, from which a delicate cord passed directly backward, attaching itself to the inner part of the iris; no perforation of the iris visible. Lens somewhat opaque; vitreous not to be illuminated with the ophthalmoscope. Under oblique light its upper inner part looked intensely white in a round spot of about 4 *mm.* in diameter, resembling a pustule. Nothing could be detected about the foreign body. Dr. K. attached a thin probe-like iron point to an electro-magnet, and made with a Beer's knife an incision of about 6 *mm.* between the inner and inferior recti. A large bead of somewhat streaky vitreous came out, but no foreign body. He introduced the end of the magnet once, twice, a third time; no click, but a black body was visible in a bead of vitreous, projecting out of the wound. It was a chip of steel, 2½ by 1½ *mm.* The conjunctiva was tightly united. It remained swollen four days. Pupil dilated; lens opaque in its inner region, through

[35] Ibid., Juli, 1880.

[36] These ARCHIVES, x, p. 145 (German edition, x, p. 236, Jan., 1881).

[37a] *Klin. Monatsbl. f. A.*, June, 1881.

[37] *The Medical Record*, New York, Nov. 13, 1880.

[38] These ARCHIVES, ix, 2, p. 213, June, 1880.

which the foreign body must have passed ; floating white streaks in the vitreous. S=$\frac{1}{8}$. This was the condition May 25, 1880. The eye was subsequently enucleated.

Drs. Joy Jeffries and Williams,[39] of Boston, successfully utilized the traction of an electro-magnet to facilitate the extraction of steel chips which had penetrated into the aqueous chamber.

On June, 1881, I met with the first French case. Dr. Galezowski[39a] had a patient, whose cornea, iris, lens, and vitreous body had been traversed by a chip of iron, which was embedded in the retina. Dr. G. made a sclerotical section between the superior and external recti, extracted the foreign body with a magnetic probe, and united the sclerotical wound by stitches. The wound healed well. No details about the final result.

The able paper of Dr. Simeon Snell, of Sheffield,[40-44] is also of recent date.

(*a.*) A miner had a wound in the cornea ; lens opaque ; metal in the vitreous. After the opaque and softened lens matter was removed, a bar-magnet was passed into the vitreous, but failed to detect the piece of steel, though the subsequent removal of the eyeball demonstrated the fragment lying at the fundus oculi.

(*b.*) James C., aged 33, on September 10, 1880, was hit in the righ eye by a piece of iron, and came immediately to the doctor. On the inner side of the selerotic, at some little distance from the cornea, was a small horizontal wound ; foreign body in the vitreous, near the selerotic wall, detached by probing. The only electro-magnet at hand, too large to be *introduced*, was *applied* to the wound, carefully held open for a little time, and the foreign body found to be fairly in the wound and readily removed with forceps. Vision perfect, February, 1881.

(*c.*) L. S., aged 45, with a mark in the cornea, in the capsule, and a piece of iron at the back part of the opaque lens, a fortnight after the injury. The eye was quiet ; inferior corneal flap section ; capsulotomy ; extraction of the metal by the introduced tip of the electro-magnet. V = $\frac{20}{40}$.

(*d.*) An elevation of the upper lid was noticed a few weeks after injury. Dr. S. cut across it, introduced the needle of the electro-magnet, and immediately withdrew a piece of metal.

(*e.*) Case of a boy, six years old, who had, six weeks previously,

[39] *Boston Med. and Surgical Journal*, March 31, 1881.

[39a] *Recueil d' Ophthalm.*, June, 1881.

[40-44] *British Med. Journal*, May 28, 1881.

whilst striking two hammers together, hit the left eye. Symptoms, operation, and result similar to case *c*.

The following operation was suggested by Dr. Snell's paper.

H. H., 16 years old, was struck by a piece of steel.[46] An incised wound, about a quarter of an inch long, and horizontal in direction, was found on the outer side of the eye, just over the sclero-corneal junction. The prolapsed iris was snipped off, atropine instilled, and the eye firmly bandaged. On the following morning no pain or irritation; with the ophthalmoscope a bright, glistening piece of steel could be distinctly seen suspended in the vitreous, posterior to and on the upper and outer side of the centre of the globe. Mr. Salt Junior constructed at once for the surgeon an electro-magnet, connected with a 30-cells Stöhrer battery. Dr. Lloyd Owen—ether being administered—made an incision posterior to the ciliary region and above the insertion of the externus muscle, through the tunics, passed the point of the magnet into the globe, and at once removed the piece of steel. One week after the operation, the eye was quiet. $V = \frac{20}{xx}$.

Dr. Snell has constructed a new electro-magnet bearing 175 grams (with a needle 2 *mm.* thick)[1]; Dr. Bradford another for Joy Jeffries; a third one is mentioned in four of the above-quoted histories (viz., Nos. 17, 34, 36, 37a). Dr. Grüning[2] has constructed a permanent magnet of six parallel rods, with a delicate iron stem, which is capable of sustaining a weight of fifteen grams. Dr. Knapp[3] found, by comparison, the electro-magnet to be the stronger, and therefore better suited for the extraction of the chips than the permanent magnet. Dr. Wolfe, of Glasgow,[4] has also recommended the electro-magnet of Hirschberg. The author's electro-magnet, constructed 1877, is above mentioned. Finally, Dr. Pooley, of New York,[5] made experiments, based

[46] Dr. C. Lloyd Owen, F.R.C.S.E., Surgeon to the Birmingham Eye Hospital. *British Med. Journ.*, 1881, June 25.

[1] I had the opportunity of examining it, and found it very strong; only I would like to have also smaller and bent needles.

[2] *The Med. Record*, New York, 1880, May 1st.

[3] *L. c.* [4] The *British Med. Journal*, Feb. 14, 1880.

[5] These ARCHIVES, ix, 2, 1880.

upon the principle that if a fixed magnet attracts a movable piece of steel, a fixed piece of steel must attract a movable magnet (magnetic needle); and so the presence of iron within the eyeball, sometimes doubtful, is made certain. Dr. Pagenstecher praises Dr. Pooley's experiments and corroborates his views. Dr. MacHardy fears that Dr. Pooley is over-sanguine on this point.

I have finished having collected *a historical series of more than forty clinical cases in which the magnet has been used and often proved satisfactory.*

This part of ocular surgery, hitherto passed over with silence in text-books, will appear there very soon as a conspicuous chapter, because it is more than a curiosity, nay, one of the important parts of our practice.

ON THE SO-CALLED CONCUSSION OF THE RETINA.

By Dr. MORITZ HERDEGEN.

Translated by James A. Spalding, M.D., Portland, Maine.

THERE was a time when all those transitory and permanent disturbances of vision after injuries of the skull or eye by blunt force were collected under the general name "concussion of the retina," so long as no other theory could be substantiated by demonstrable anatomical changes. This indefinable affection of the retina or optic nerve, accompanied, according to the degree of its severity, by visual disturbances of longer or shorter duration, was generally considered as analogous to the common types of *concussion of the brain.* But this analogy was by no means complete, for the idea of a concussion of the brain presupposes an alteration in the activity of all its centres, accompanied with longer or shorter loss of consciousness. In correspondence with this, we ought to have total loss of vision, which, however, has never been observed in a majority of cases of concussion of the retina, or if observed, has generally been referred to other causes, *e. g.*, complicating injuries of the skull. Vision may be entirely lost, even though transitorily, after injury of the eyeball, from ischæmia of the retina, and it would be well worth the while to examine this question more carefully. But the fact that we have to rely for our knowledge of the disturbance of vision entirely upon what is said by the patients, who are often psychically affected by the accident, interferes greatly with our judgment of the initial symptoms.

R. Berlin[1] was the first to show that the whole subject once included under the general title "concussion of the retina," ought to be separated into various subdivisions, the first of which should include those disturbances of vision which are observed after injuries of the skull, because they rest upon a simple anatomical basis. Berlin's opinion of this group (*l. c.* 69), "that the cause of the functional disturbance lies presumably in a primary or secondary lesion of the optic nerve or its roots," has since been confirmed by v. Hölder's researches, reported at the Twelfth Ophthalmological Congress at Heidelberg, in 1879.[2]

The proof exhibited by this paper that 88 out of 126 cases of fracture of the skull appertained to the base, while 54 of the 88 were complicated with *fractures of the walls of the optic canal* (a fact hitherto unknown), was of decisive influence upon the previous theories of concussion of the retina, and all the more since in 42 of these 54 fractures hemorrhage was observed in the sheaths of the optic nerves.

Berlin then expressed the opinion that a majority of the disturbances of vision after injuries to the skull from blunt force, were due to fractures of the walls of the optic canal. In his latest work, on the diseases of the orbit,[3] we find an able description of the immense variety of cases belonging to this category: those rare bilateral affections depending upon an intracranial destruction of the substance of the optic nerve near the chiasma, or upon a hemorrhage in that district; then those incurable unilateral forms of complete and sudden blindness from crushing of the nerve inside the optic canal; and, finally, those transitory, more or less important disturbances of vision which are probably due to hemorrhage into the subvaginal space. Of course there are also many cases which belong partly to one and partly to another category, cases in which we cannot tell whether the anatomical basis of the affection depends upon a hemorrhage or upon a lesion of the nerve itself.

[1] *Klin. M. f. Aug.*, 1873, page 42, *et seq.*

[2] Bericht über d. 12te Vers., etc., zu Heidelberg, *K. M. f. A.*, 1879, p. 9.

[3] Graefe-Saemisch, Handbuch, cap. xi, § 42.

These views have met with general recognition, and most recently have been endorsed by v. Bergmann in his theory on injuries of the head.[1]

On the other hand, v. Oettingen[2] has lately published several cases, in five of which he concludes that we must support the ideal theory of concussion of the retina.

But if we examine these cases thoroughly, we see that four of them depended on fractures of the bones of the orbit, so that it is quite unnecessary for us to explain the disturbance of vision by concussion of the retina, because Berlin has already proved that the cause of such disturbances is to be looked for in a fracture extending to the optic canal. The fifth case, moreover, belongs to the class of direct injuries of the eye itself, while the details of the case seem to indicate traumatic myopia with lenticular astigmatism.

Having thus shown that we do not need a concussion of the retina to explain the cases included in this category, let us turn to those injuries in which the eyeball alone is directly injured. Here also we must distinguish two groups: severe cases with complete loss or an excessive diminution of vision, usually of long duration and accompanied with defects of eccentric vision; and, secondly, slighter cases of trivial and brief diminution of central vision alone.

The first group of such cases, without any demonstrable alteration in the interior of the eye, is extremely rare, as is emphasized by Berlin (*K. M. f. A.*, page 57) in agreement with Knapp[3] and Geissler.[4]

In the earlier literature bearing upon this point, we find, however, a few cases by Testelin,[5] Talko,[6] and Secondi,[7] in which no anatomical changes could be discovered, and concerning the nature of which we may here cite Berlin's opinion (*l. c.*, p. 70): "For these cases I would like to sub-

[1] Deutsche Chirurgie, 30te Lieferung, 1880, page 356.

[2] Die indirecten Laesionen des Auges bei Schussverletzungen der Orbitalgegend, 1879.

[3] These ARCHIVES, vol. i, page 150.

[4] Verletzungen des Auges, von Zander und Geissler, page 386.

[5] *Klin. Mon. f. Aug.*. Band iii, 1865, page 358.

[6] *Klin. Mon. f. Aug.*, Band vi, 1868, page 79.

[7] *Annali di Ottal.*, Anno. i, Fasc. 2, p. 113.

stitute the term traumatic amaurosis, or amblyopia, a name which, without prejudicing the locality of the pathological alterations, would compel us to search unweariedly for some demonstrable alterations, and not permit us to rest contented with the dogma of concussion of the retina."

The only recent case is that by Laqueur,[1] in which we notice that he returns to the old name,—concussion of the retina.

A girl, æt. 17, bent over and hit her right eye against a small iron rod and became instantly blind. Three hours later there was a small incision in the conjunctiva near the insertion of the rectus internus. The pupil did not react. Blindness in the entire F. The ophthalmoscopic image was negative. Three weeks later, the optic nerve showed signs of incipient atrophy.

As Laqueur says nothing about sounding the wound, he fails to prove that the optic nerve had not been wounded beyond the entrance of the retinal vessels, while on the contrary the rapid appearance of atrophy would favor such a view.

In addition to these severe forms, there is a series of disturbances of vision after contusion of the eyeball, which are transitory and slight, and it is these especially which shall serve as the subject of this paper. Even in these, again, the retina has generally been supposed to have undergone concussion. Berlin was the first to enter upon more extensive experimental and clinical studies[2] regarding the nature and sequels of these injuries, the results of which we will here briefly relate.

When the eye is struck a severe blow (with the fist, or larger or smaller pieces of metal or stones, or from contact with heavy bodies), the retinal blood-vessels, as has been proved in rabbits' eyes, are instantaneously deprived of their blood. This phenomenon is purely mechanical, arises from compression of the eyeball, and lasts but a few seconds.

[1] *Klin. Mon. f. Aug.*, Band xv, 1877, page 231.

[2] 1. Zur so-gen. Commotio. Retinæ., 1873. 2. Fälle von traumat. Accommodotionskrampf. Bericht der ophthal. Gesellsch., K. M. f. A., xii, 1874, pag. 461. 3. Ueber traumat. Myopie. Separat-Abdr. a. d. Bericht der 49ten Naturforsch. Vers., Hamburg, 1876. 4. Ueber traumat. Linsenastigmatismus. Bericht, ü. d. 10te ophthal. Congress zu Heidelberg., K. M. f. A., xv, 1877, pag. 174.

The vessels then fill again, apparently to an absolutely normal degree. This phenomenon, of course, cannot be observed in the human eye, because it is so much more difficult to make an ophthalmoscopic examination soon after an injury than during an experiment.

A further direct result of the blow is a distinct diminution in the size of the pupil, and, occasionally, an exfoliation of epithelium if the cornea has been hit. The episcleral vessels, moreover, show a decided amount of congestion, which, as well as the contraction of the pupil, usually increases in the early hours after the injury. In addition to the contraction of the pupil, the sphincter of the iris shows an abnormal resistance to atropia. Finally, central vision is at once reduced after that injury to $\frac{15}{10}$, $\frac{15}{100}$, provided that there has been no hemorrhage into the anterior chamber, or loss of transparency on the part of the cornea.

Vision may be totally abolished at the moment of the injury, from the absence of blood in the retinal vessels, but such a condition cannot easily be demonstrated, as we have already remarked.

In about an hour after the injury we begin to see changes in the retina (which has hitherto been intact), in the shape of irregular, gray dots, which gradually coalesce into a continuous opacity as large as 12 P. D. The opacity by and by changes its color, becoming brighter, and sometimes dazzlingly white. The retinal vessels usually cross the opacity in unaltered direction, but are very distinctly set off. The retina sometimes contains hemorrhagic effusions, and if the force applied were extreme, the retina may be ruptured. The seat of the opacity is determined by the direction in which the given force struck the eyeball, *i. e.*, it lies in the continuation of the *vis a tergo*.

It is not merely in the fundus of the eye, however, that we find an opacity, but in that portion of the retina which corresponds to the injured region of the eye, provided that the sclera only was hit, and at a spot behind the ora serrata.

If we examine a rabbit's eye in which this condition of things has been imitated experimentally, we always find a

hemorrhage corresponding to the opacity in the retina, and that this is the case for both the directly and indirectly injured region of the fundus of the eye. If the blow struck the cornea, we find a hemorrhage between the ciliary muscle, or anterior segment of the choroid, and the sclera, at the seat of the direct injury; the indirect lesion is then indicated by subchoroidal hemorrhage, usually at the posterior pole.

Hemorrhages are also frequently noticed between the pars ciliaris retinæ and the choroid, as well as smaller extravasations at the posterior wall of the iris and in Schlemm's canal. The subchoroidal extravasations correspond in size with the retinal opacities, but they are always more extensive at the spot of the direct injury. This peculiar correspondence in locality and extent would seem to indicate a similar cause in each.

The hemorrhage is due to rupture of choroidal vessels. If the blow is very powerful, the choroid may be entirely ruptured, in which case subretinal hemorrhage may also be noticed. The retina at the opaque region is usually enormously thickened, swollen, and occasionally interspersed with fissures. Small folds are also noticed at the summits of the swollen parts. Berlin regards the swelling and turbidity of the retina as an acute œdema, or serous infiltration, the material for which is supplied by the aqueous portion of the subchoroidal hemorrhage.

Where now lies the connection between the disturbance of vision and the alterations in the eye? We must here first remember that several cases of loss of vision have been recorded without any of these alterations in the retina, as well as that the disturbance of vision and the retinal affection do not develop side by side. For while vision is at its worst, directly after the injury, then improves rapidly for a short time, and finally very slowly, the retinal opacity does not appear till one or two hours after the lesion, at a time when vision has already improved. But, on the other hand, the opacity disappears in a day or two, while it takes a long time for vision to be restored. Finally, observations show that the disturbance affects central vision only, and is en-

tirely independent of the locality of the opacity. From these circumstances Berlin concludes *that the disturbance of vision is generally independent of the retinal opacity.*

Berlin thinks in his first paper (*l. c.*, pag. 63) that the probable cause of the slight and transitory disturbance of central vision depends on a *lenticular astigmatism*, arising from extravasations of blood between the iris and lens, and thus influencing the form and position of the latter. Such hemorrhages are invariably seen in rabbits, while the frequent appearance of hyphæmia and partial bulging of the iris would seem to indicate a similar condition in human eyes. Under these circumstances we should probably have a flattening of the anterior surface of the lens, an alteration in the radius of curvature, and a possible change in the position of the lens.

The most important support for this view lies in the fact that later observations in a large number of cases have really demonstrated the presence of a transitory astigmatism,[1] in which the disturbances of vision correspond to that observed in the higher degrees of astigmatism. But the astigmatism was always *myopic*, which leads us to another point.

We discovered in a number of cases a slight myopia (1.25 to 4 D), which gradually disappeared with the disturbance of vision. Still the latter was not solely caused by the myopia, for after this was corrected, vision was still below normal. Berlin, therefore, referred the myopia to a *spastic condition of the ciliary muscle* dependent upon the violent irritation caused by the injury. Now the narrowness of the pupil, the form of the anterior chamber,[2] and especially the circumstance that the myopia disappears when we succeed in completely dilating the pupil in spite of the resistance of the sphincter, all favor such a theory. The reason why we cannot produce normal vision after correction of the myopia, lies, according to Berlin, in an *irregular astigmatism of the lens.* But this observer has recently arrived at the conclusion that this condition does not depend alone on

[1] Ueber traumat. Linsenastig., *l. c.*, page 171.

[2] Völcker's Sitzungsbericht der opththal. Gesellsch., *K. M. f.* 1874, p. 461.

extravasations of blood directly around the lens, but on ***irregular contractions*** of the ciliary muscle, which has not undergone an equal amount of injury at every portion of its circumference. The astigmatism and myopia are not necessarily paired, for the myopia may appear alone, but when astigmatism is present it is always accompanied with myopia.

Among numerous cases we may cite one by Hirschberg:[1]

A patient hit her right eye against the swinging end of a large rope, and at once became almost blind; ten minutes later the outlines of large objects were visible. On the next day the patient could read Sn. $1\frac{1}{2}$ at $7''$ with the best eye, only medium type with the right eye, with $+ 6$, Sn. 2 at $5''$; fingers eccentrically in all directions. There was a small wound in the corneoscleral region of the right eye, pericorneal injection, moderate mydriasis, and a slight rupture of the pupillary border. The ophthalmoscope revealed a diffuse whitish opacity of the retina, radiating in all directions from the optic papilla, vessels remarkably well defined, macula lutea clear, and an appearance like a slight detachment of the retina, probably due to a small fold in the retina, or to a subchoroidal hemorrhage. But nothing of the sort could be seen on the same afternoon, whilst the opacity had greatly diminished in size. Two days later the opacity was very slight; on the third day it had vanished. The tension had been about normal, the pupil moderately wide and unyielding to atropia.

Leber cites two cases.[2]

In both of these the eye had been hit with a stone the evening before; both papillæ were reddened. In one case the retinal vessels were somewhat enlarged. In the first case, a delicate whitish and dotted opacity extended from the lower edge of the papilla to the equator, while another separate one extended upward and further toward the periphery. In the second case, a much more intense, grayish-white opacity radiated in all directions from the papilla until it was lost in the equatorial region. The macula lutea was not affected, while its immediate neighborhood was but

[1] Ueber Verletzungen des Auges, Commotio Retinæ. *Berlin Klin. Wochenschr.*, 1875, page 299.

[2] Krankheiten der Netzhaut und des Schnerven. Graefe-Saemisch, chap. viii, page 747.

slightly veiled. The opacity completely covered the pigment epithelium and stroma of the choroid; toward the periphery it dissolved into smaller patches and dots, between which a more normal fundus was visible. The retinal vessels showed no difference in elevation in their course over the opacity. Tn. The opacity was much less intense in the afternoon of the same day, while on the next day it had entirely disappeared, although the hyperæmia of the retina persisted for a few days longer.

In the second case, vision sank, directly after the injury, to fingers at 6′. On the next morning, S $\frac{20}{40}$, and F, complete, although an extensive opacity of the retina was still present. Leber mentions episcleral injection, traumatic mydriasis, and slight hyphæmia as concomitant symptoms.

Finally, we find a few cases described by Nettleship:[1]

A boy, æt. 14, had been hit in the right eye fifteen hours before with the ferule of a cane. The eye was reddened and sensitive, but the cornea was unharmed. Tn; S $\frac{12}{60}$; Jaeger No. 3 read. The right pupil was contracted, reacted slightly toward changes of light, and moderately well, though irregularly, to atropia. The iris appeared normal, the refractive media clear. The retina was extensively opaque and white, downward and outward toward the periphery; there was no difference in elevation of the vessels, which were, however, very sharply defined. Six days later, after the application of cold compresses and confinement in a dark chamber, the eye was normal and the opacity had disappeared. We must, however, notice that a central scotoma soon appeared and continued for about three months.

In the second case, a workman, æt. 19, the eye was hit by a bit of iron as large as a walnut. Two hours later, S=$\frac{20}{200}$, Jaeger 10 at 9″. The cornea was slightly grazed (not perforated) at the scleral margin. The pupil was irregular, oval, and enlarged, but it dilated completely after atropia. The refractive media were clear. A small retinal opacity was observed just below the yellow spot, distinctly marked toward the fovea centralis, but shading off toward the periphery. The region of the macula was normal. There did not seem to be any difference in level between the opacity and its surroundings. The opacity was less distinctly defined on the following day, and a few days later, at the last examination, it was much reduced in size.

[1] *The Lancet*, June 19, 1880. Clinical lectures on some effects of blows upon the eyeball.

It seems impossible for all these authors to free themselves from the idea that the opacity of the retina plays the chief rôle in the disturbance of vision. Berlin himself told me that at first he had been impressed with the idea that this opacity represented the real ophthalmoscopic (anatomical) foundation of the so-called concussion of the retina. But it was not until he had extended his clinical observations regarding the development and course of the disturbance of vision and the retinal opacity, that he became convinced of the error of his original views.

Berlin's views have been unreservedly accepted by Arlt[1] and Becker,[2] and so far as concerns the traumatic spasm of accommodation by Völkers,[3] who thus narrated a case of his own.

A man, æt. 20, was wounded by a projectile, near the right orbit, between the rectus superior and externus. A few hours later, the conjunctiva was found to be extremely chemosed; myopia 5½. There was also considerable resistance against atropia, which, however, gradually disappeared, so that the pupil became fully dilated. The myopia, however, had been diminished to $\frac{1}{30}$. On the next day the eye was emmetropic. The ophthalmoscope did not reveal any thing abnormal, and S was perfect. A comparison of the two anterior chambers gave reason to suspect some spasm of accommodation, for the whole lenticular system in the injured eye lay extremely close to the cornea, while the form of the anterior chamber resembled that which we see during the strongest exertion of accommodation.

The objections raised by Mauthner[4] that we have no proof of the astigmatism, may possibly have been answered by Berlin's subsequent observations. If we have never yet been able to demonstrate astigmatism with the ophthalmoscope, as Mauthner desires, it is sufficient for us to point at the difficulties in the way of such an examination, *e. g.*, the excessive narrowness of the pupil and the great irritability

[1] *Wiener Med. Wochensch.*, 24 Jahrg., 1874, pag. 192.

[2] *Klin. Mon. f. Aug.*, 1878, pag. 41.

[3] *Sitsungsbericht d. ophth. Gesellsch.*, 1874. *Klin. Mon. f. Aug.*, Band xii, pag. 461. Compare also, Dehenne: *Moniteur de la Policlinique*, 30 mars, 1879, Obs. ii.

[4] *Jahresbericht für Ophthalmologie*, Band iv, 1875, pag. 339.

of the affected eye. Still, this deficiency might be made good by the proof which has been gained in some cases of the presence of astigmatism by the functional test of S, as well as by the partial correction in others of the same error of refraction by means of concave cylinders.

Nagel (*l. c.*) is one of Berlin's most determined opponents, and while citing Mauthner's views, he remarks: "It seems to me that, in explaining the disturbance of vision after contusion of the eyeball, Berlin has overlooked some important circumstances. Amongst these, we may first mention the diminution in tension, which is almost invariably noticed, even if transitorily, after moderate contusions, influencing refraction and accommodation, as well as the transparency of the cornea. Next we have alterations in the refractive media, the most important of which, in my opinion, is that of the aqueous humor. For even in cases in which there is no hemorrhage at all, or only to a slight degree in the anterior chamber, or even if there is no iritis, the aqueous is almost always turbid in the early days after the injury, and the anterior chamber filled with a translucent coagulum which is rapidly absorbed, whilst vision is proportionally restored."

But Berlin has not "overlooked" the opacity of the aqueous as a cause of the disturbance of vision, for he says[1] that loss of the corneal epithelium, *effusions into the anterior chamber*, etc., are not to be considered in his series of observations, for such conditions invalidate the tests of the relations of accommodation, either by the disturbance of vision or the great sensibility of the eye which they cause. On the contrary, he emphasizes the fact that he means to exclude such cases.

So far as concerns Berlin's oversight of the tension of the eyeball, we merely notice (*l. c.*, page 46) that he had never been able to detect any changes in tension. And as for the observations of Schliephake[2] and Heimann, which consist essentially in a diminution of tension, and "extravasation of lymph" into the anterior chamber after con-

[1] Zur so-gen. Commotio Retinæ, pag. 45; (also) pag. 43.

[2] These ARCHIVES, vol. v, p. 479.

tusion of the eye, I would say, as regards the former condition, that Berlin's opinion is confirmed by Leber, Hirschberg, and Nettleship. Hirschberg indeed says (antea), "The tension was about normal" (which might be construed to mean that the tension was slightly diminished). Berlin has also noticed a slight diminution of tension in some recent cases, but Leber and Nettleship emphasize the normal state of tension. But such a slight decrease in tension as noticed in these cases would be most easily explained by assuming that a portion of the vascular supply had been temporarily cut off from the injured eye, as shown by the subchoroidal hemorrhages, without compelling us to accept the hazy theory of a vaso-motor neurosis. Moreover, in a traumatic spasm of accommodation we have a much more plausible basis for the transitory myopia, than in the fugitive diminution of tension, which is by no means constant.

If Heimann has seen "extravasations of lymph," which "could not be inflammatory exudations, but the exudation of a coagulable fluid, *probably from a ruptured lymphatic vessel*," it should be his next task to demonstrate them anatomically. When he adds that "such an occurrence is much more frequent than Berlin's lenticular astigmatism," I can affirm that in his last 17,679 eye patients, Berlin has seen 27 cases of slighter disturbances of vision after contusion of the eyeball, without being able to discover a single case of the so-called extravasation of lymph, while he has seen two cases which developed into genuine exudative iritis.[1]

In conclusion, let us give a *résumé* of the disturbance of vision caused by blunt force.

In the slightest form we have a moderate diminution of central vision, without disturbance of eccentric vision, but with a tendency to rapid recovery,—all depending on a transitory traumatic lenticular astigmatism. A majority of such cases show some retinal opacity as well as a remarkable contraction of the pupil, although occasionally the pupil loses all capacity for excessive contraction or dilata-

[1] Zur Commotio Retinæ, p. 55.

tion, as has been observed by Nettleship (*l.c.*) and Berlin. We also meet now and then with traumatic mydriasis, in which, if we cannot discover any rupture of the sphincter, we are to assume some disturbance in the region of the ciliary nerve.

The following instructive case of the first group illustrates the spasm of accommodation, with a momentary change in the same during the period of observation.

C. K., æt. 25, locksmith, was hit in the right eye by a piece of iron as large as a bean, about an hour ago. He says that while chiselling a piece of cast-iron, and looking steadily at the piece which he was trying to cut, it flew off to the right, struck the wall of the narrow arch in which he was working, ricochetted upward and to the left, and then struck his eye with a great deal of force. The conjunctiva, as well as the outside of the upper lid, is swollen; the anterior chamber is partially filled with blood; the pupil is narrow and does not react to light; tension is normal. Vision could not be tested, nor an ophthalmoscopic examination undertaken on account of the blood in the anterior chamber. Treatment consisted in the application of Aq. Saturnina and rest. On the following morning, eighteen hours after the injury, the right eye is perhaps a trifle softer than the left, the subconjunctival tissue moderately injected. The pupil is extremely contracted, but reacts a trifle to light. The hyphæmia has disappeared. Right eye: M 4D, S $\frac{15}{10}$; for a moment, S $\frac{15}{10}$. Schweigger's parallel lines are seen most distinctly at 3′, when they are held from inward and upward to outward and downward. Eccentric vision seems undisturbed. The outer and upper portion of the retina shows an extensive opacity, with diffuse edges, the upper and anterior edge of which cannot be defined with the ophthalmoscope. Left eye: M 2.5 D; S $\frac{15}{30}$. Twenty-four hours later, No. 30 read with—2 D. The lines of the astigmatism table, running in the direction before mentioned, are recognized as distinctly, if not even more so, than those running diametrically opposite. The tension in both eyes is alike; the retinal opacity has disappeared; the pupil is still somewhat narrow, but more movable than yesterday. Six days later the eye seems normal, with 1.75 D; S $\frac{15}{20}$, with difficulty.

It is plain that this group cannot always be strictly separated in practice from those cases with a distinct lesion of

the retina. Berlin mentioned, in his earlier experimental observations, that there are cases in which the retinal opacity is accompanied with small extravasations of blood, and even minute fissures in the retina, which were plainly visible to the naked eye. It is impossible for us to say whether these slighter injuries of the retina heal when they occur in human eyes, although it is quite probable that they may. It is presumable, in a clinical point of view, that they produce a greater disturbance of vision than the first group, while they heal much less rapidly and in many cases only imperfectly. We probably have an instance of this sort in the first of Nettleship's cases (No. 1, *l. c.*), in which a scotoma persisted after the disappearance of the retinal opacity. We have a still more striking case of this transitional form in the following unpublished case under Berlin's care:

A. R., æt. 24, was hit in the right eye, sixteen hours before, with a leaden ball as large as a buck-shot, hurled with great force from a rubber bean-popper. The sphincter of the iris is slightly torn in a downward direction; S $\frac{15}{200}$ with—2.5D, $\frac{15}{20}$. The vertical lines in Schweigger's test are seen most distinctly. The retina shows an opacity downward and inward, which is striated with small extravasations. On the next day, with —2.75D, S $\frac{15}{100}$. Three days later, Em, S $\frac{15}{20}$. Hm (+1.5 D) appeared in the next fourteen days; S $\frac{15}{10}$, at which it has still continued.

The following case offers an example of still more extensive injury of the retina:

G. F., æt. 11, was injured in precisely the same way in the right eye, only with a larger missile. Two days later the ophthalmoscope revealed an extensive opacity of the retina, accompanied with hemorrhage and varicose vessels. S $\frac{1}{10}$. After absorption of the blood, the retina was seen to have been extensively torn in an outward direction. S increased to $\frac{15}{200}$ in the course of time.

It is quite probable that the retina is injured in a similar though less extensive manner in those cases of rupture of the choroid in which we cannot recognize any lesion by means of the ophthalmoscope, in spite of a permanent and moderate degree of loss of vision. In this point of view we are, so far, without anatomical demonstrations.

In other cases of rupture of the choroid, the permanent and central disturbance of vision is so extreme, and the affection of eccentric vision so peculiar, that, inasmuch as the retina is absolutely uninjured, we are compelled to assume a simultaneous lesion of the trunk of the optic nerve, as v. Graefe long since [1] suggested. Future observations may throw some light on those hitherto unexplained cases of disturbance of vision, without ophthalmoscopic alterations, after contusion of the eyeball.

Supplement.—The author being unable to finish his remarks on the mechanism of compression of the eyeball, I propose, in some future number of these ARCHIVES, to say a few words on this point. R. BERLIN.

[1] *Klin. Mon. f. Aug.*, 1865, p. 366.

CIRCUM-CORNEAL HYPERTROPHY OF THE CONJUNCTIVA.

[FRÜHJAHRS-KATARRH (SÄMISCH); CONJUNCTIVITE PRINTANIÈRE (DE WECKER); SPRING CATARRH OF THE CONJUNCTIVA.] —WITH SOME PECULIARITIES OF ITS APPEARANCE IN THE NEGRO.

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THIS affection seems to have been curiously ignored by American and English writers and clinicians. Even so close an observer as Nettleship makes no mention of it in his excellent little manual, and I am not able to find it in any edition of Wells—even in the last American, which was issued under the editorship of Dr. C. S. Bull. Nor have I found it in any of the reports of hospitals or clinics to which I have access. And yet it possesses characteristics which entitle it to a separate and distinct place in our nomenclature. This fact has been recognized by a number of continental writers, among whom are Sämisch (Brockhaus), De Wecker, Horner (Vetsch), Arlt, and Reymond. We are indebted to Sämisch[1] for the first full and accurate account of the clinical history of the disease, although Arlt claims, in his latest work,[2] that he gave a description of the affection in 1846, and made further mention of it in his textbook in 1851. He acknowledges, however, that at that time he was not aware of the peculiar appearance of the palpebral

[1] Handbuch d. gesam. Augenheilk., B. iv, p. 25, *et seq.* 1876.

[2] Klin. Darstel. d. Krankheiten d. Auges, 1881.

conjunctiva pointed out by Vetsch,[1] nor of its disposition to return during the spring months for a series of years. The fullest consideration of the subject we find in the work of Vetsch (*l. c.*), the material being furnished by the clinic of Prof. Horner.

Wecker[2] considers it a variety of phlyctenular disease, and bases his opinion on the fact that it is never accompanied by any conjunctival secretion. In this, however, he is at variance with the observation of the writer and of all the authors quoted. There is not, it is true, at all times a mucous secretion, and at no time is it considerable in amount, but it usually begins, according to the statement of the patient or its parents, with a considerable redness of the eyes and a gumming of the lids in the morning, if not with a perceptible discharge of mucus. Its classification, therefore, among the conjunctivitides seems clearly warranted. The affection described by Desmarres[3] under the name of "hypertrophie périkératitique de la conjunctive," answers very well to the clinical aspects of the disease we have under consideration. Gräfe, in his clinical lectures in 1854 and '55, also described a condition which was undoubtedly similar, to which he gave the name of "Gallertige Infiltration des Limbus."

The affection is chiefly characterized by the presence of a yellowish-gray elevation at the limbus corneæ, and encroaching more or less on the surface of the cornea itself. It may occupy the whole limbus or only a portion. Most frequently it is found at several points around the circumference, at some places in the form of almost circular nodules, while at others the space occupied is from 4 to 6 *mm.* in extent. Its breadth varies from 1 to 3 *mm.* The edge lying on the cornea is quite clearly defined, while the scleral edge gradually fades away into the surrounding conjunctiva. It has a rather soft, succulent appearance, though at no point is there any indication of pus-formation or of ulceration.

There may or may not be conjunctival vessels running up to it, but even when there are none I have found, on exam-

[1] Ulrich Vetsch: Inaug.-Diss., über Frühjahrs-katarrh. Zürich, 1879.

[2] Thérapeutique oculaire, Paris, 1879.

[3] Traité des maladies des yeux, t. 2, p. 184, 1855.

ining by means of the oblique light and a magnifying lens, a number of fine vessels about the scleral edge and running into the mass itself. These appearances are totally unlike any other pathological condition found in the eye. They differ from those of phlyctenula, with which it would most likely be confounded, in the greater extent of surface occupied, and in its general appearance. A close examination would at once reveal the difference between this broad succulent mass and the clearly-marked vesicle or pustule of the phlyctenula. Moreover, the subjective symptoms, as we shall see, are very different. The cornea itself, interior to the elevation, is not in any way affected, and the deeper structures of the eye are never involved.

The *conjunctiva itself*, in addition to the slight injection which is sometimes present, usually appears thickened from infiltration and dull, and, in the white race, of a yellowish-red tinge, which is especially noticeable at the palpebral opening. I have noted, particularly in negro children, a tendency on the part of the conjunctiva to fall into vertical folds toward the inner and outer canthi when the eye was turned inward or outward, which was clearly due to the infiltrated condition.

In addition to these appearances, which I have observed in both the white and colored races, *I have found quite a peculiar and remarkable appearance in the conjunctiva in every case of this disease I have met with in the negro.*

This consists in a brownish discoloration of the conjunctival tissue, most intense at the scleral base of the mass, and gradually fading away toward the equator of the ball. This discoloration, which is undoubtedly situated in the conjunctival tissue itself, as well as in the epithelial layer, is not regular in its distribution, but appears to consist of a collection of small deposits of brown pigment. These deposits are sometimes collected in rather large masses, particularly near the base of the elevation, but toward the equator they appear as small brownish specks in the dull and succulent conjunctiva. In some instances this brownish discoloration extends but 3 *mm.* from the circum-corneal elevation, while in others it reaches almost to either canthus. It does not usually ex-

tend so far toward the equator of the globe in either the superior or inferior direction. In one case I have seen the whole of the conjunctiva visible through the palpebral opening present this dirty light-brownish appearance, in striking contrast to the brilliant white aspect which the sclera usually presents in this race. I have never seen any thing similar to it in any other morbid condition of the eye except in one or two cases of keratitis. This was before my attention was attracted to this peculiar affection, and it is more than probable that they may have been cases of this disease, perhaps in a stage of decline, in which there was an intercurrent corneal affection.

This discoloration is not congenital, for the parents in every instance asserted that before the trouble began the eyes were as "clear and beautiful" as any child's. According to the statement of the most intelligent of them, the discoloration came on gradually, increasing a little each year with the recurrence of the eye trouble at the beginning of warm weather.

Associated with these circumcorneal changes, there are *alterations in the palpebral conjunctiva*, which are equally characteristic. Sämisch does not mention them in his treatise, and to Reymond[1] the credit is due of first calling attention to their constant occurrence in this affection. Vetsch found them in all but 4 of his 37 cases, and so much stress does he lay upon them that in some cases the diagnosis was made from their presence alone. They were present in all our cases. On the tarsal portion of the conjunctiva, and particularly along the posterior border, we find papillary excrescences, which in some instances are so delicate as to resemble fine meal-grains, while in others they are quite large and are flattened in shape rather than round. The conjunctival surface looks as though it was covered by a thin layer of milk, and the tissue appears thickened and infiltrated. In a single case Vetsch saw a grayish discoloration of the palpebral conjunctiva, which resembled argyrosis, but no mention is made of any such appearance of the conjunctiva of the globe. We have seen in one case, and

[1] Contribuzione allo studio della congiuntivite, *Ann. di Ott., anno* iv.

Vetsch mentions it also, a slight drooping of the upper lid, something like what we see in trachoma where there is much thickening of the lid, though in this case it did not appear to depend on this cause.

Another peculiarity of the affection is its *aggravation during the hot months of the year.* It generally begins in the spring and reaches its acme of intensity during the summer, and it is generally at this time that the cases are first seen. It declines during the autumn, and the eyes, in some instances, are in comparatively good condition during the winter, though occasionally there remain some more or less disagreeable symptoms all through this season.

The *subjective symptoms* are very various, but are almost identical with those we have in the worst cases of hyperæmia of the conjunctiva, and they doubtless depend upon this as a cause. There is the same uneasy, uncomfortable feeling, sometimes itching or burning, and pain on any considerable use of the eyes, particularly by artificial light. In almost every case there is a sensitiveness to bright or glaring light. The vision is never impaired further than it would be by a conjunctivitis of the same grade.

Its course is generally a long one. It lasts sometimes for 8 or 10 years. I have not followed any of my cases longer than 3 years.

Its *termination*, according to Vetsch, may be one of three:

First, it may disappear without leaving any trace. Secondly, the corneal limbus may become permanently thickened, giving the cornea a narrow contracted look; or it may result, thirdly, in genuine corneal opacity.

As regards the peculiar discoloration of the ocular conjunctiva in the case of the negro, I am not in a position to say with any degree of certainty whether it disappears with the subsidence of the affection or not. In one of my cases, seen for the first time this summer, the characteristic appearances were seen in one eye only (the left), though the father of the boy said that usually both eyes had been affected during the preceding three or four seasons. In the affected eye the appearances were most pronounced,

while in the other there was only the slightest trace of the circumcorneal elevation and conjunctival discoloration. I was unable to learn whether or not the conjunctival discoloration had been present during the attacks in the right eye. I should think, however, that, as a rule, some discoloration would remain even after all the other symptoms had subsided. This case also forms an exception to the general rule that both eyes are affected at the same time.

It seems to be a *disease of childhood*, though adults are by no means free from it. Vetsch reports one case in a woman of 37 years, and I have seen it in a white woman of 26 years. The majority, however, are below 12 years of age, and the larger contingent of cases seems to come from the female sex.

With regard to the *pathology*, we are yet completely in the dark. It seems to bear no relation whatever to any other eye affection or general pathological state. In its anatomical characters it *resembles psoriasis* more than any other affection. On section, the circumcorneal mass shows moderate epithelial thickening, and irregular elevation of the stroma, with small round cellular infiltration and increase of connective-tissue elements. There is a fine vascularity of the conjunctiva around and even in the substance of the elevation itself, but there seems to be rather a poverty of vessels elsewhere. The papillary excrescences on the conjunctiva tarsi have essentially the same histological character as that of the circumcorneal mass. (Vetsch.)

In regard to *treatment* we have but little, unfortunately, to say. Local applications seem to exercise but little influence except upon the accompanying conjunctivitis. But under no circumstances are vigorous measures called for. I usually order a weak zinc solution (0.06 to 30.00 aq.), and the yellow mercurial ointment when there are any gumming of the lids and signs of conjunctival inflammation. I have directed my efforts principally to building up the system when it seemed below par, and to the protection of the eyes from all injurious influences. As there is generally a certain amount of intolerance of light, blue or smoked glasses are called for, and during the period of exacerba-

tion the child had better be removed from school. During the winter months, however, it can usually be allowed to continue its studies. On account of the apparent analogy of the pathological appearances to those of psoriasis, I have, following Wecker, given arsenite of soda in 3-milligram doses three times a day, and, it has seemed to me, with good effect.

In respect to nomenclature, it appears to me that the name which we have placed at the head of this article will convey a clearer idea of the disease and its pathology than that given by our continental *confrères*.

I.—A CASE OF PUERPERAL RETINITIS—BLINDNESS; COLOR-BLINDNESS; RECOVERY.

II.—AN EYELASH IN THE ANTERIOR CHAMBER.

By E. L. HOLMES, of Chicago.

1. In January, 1874, I met Dr. H. W. Jones, and the consulting physician Prof. H. W. Byford, in the examination of Mrs——. I was informed that the patient, who was 35 years of age, and had always enjoyed good health, was in the sixth month of her first pregnancy.

There had arisen in two weeks serious symptoms of albuminuria, quite general though not great œdema, pericardial effusion, and orthopnœa. The patient was pale, complained of headache, and was totally blind, the vision of the left eye having failed more gradually than that of the right. There was considerable œdema of each ocular conjunctiva, with absolute immobility, and moderate dilatation of the pupils, and divergence of the right eye.

Each retina was pale and œdematous, the arteries being totally concealed and the veins visible only in widely-separated points. The discs were seen only as light, quite indistinct clouds. No yellowish-white patches, as in many cases of diseases of the kidney, were present. There was in the right eye a detachment of the retina at the temporal side of the disc.

Both physicians urged the immediate induction of premature labor, and gave a somewhat grave prognosis. As I had frequently observed blindness following symptoms similar to those in this case, I could express little hope for the recovery of vision. I advised the use of hyd. bichlor., tinct. ferri mur., pot. iod., and pot. bromid., in such doses and in such combination as the physicians might deem best. The case did not remain under my care.

Six years after the illness I had an opportunity of making an

ophthalmoscopic examination of the patient. In the fundus of the left eye there were several light-colored patches indicating atrophy of the choroid. Above and bordering on the disc was a rectangular-shaped deposit of pigment. The patient could read Jæger No. 1 at ordinary distances, and believed vision was absolutely perfect. And yet "cross lights" caused more discomfort than before.

As carefully tested by Holmgren's method, the color-perception of both eyes proved to be normal. In the right eye, at the seat of the detached portion of retina, could be seen quite a long narrow deposit of pigment, which extended from the disc beyond the macula, and caused a central scotoma. In different portions of the fundus were spots of atrophied choroid. V. in the periphery of the field of vision was about $\frac{1}{15}$. Divergence could scarcely be detected, and yet there was diplopia in looking to the left, the left image disappearing on covering the right eye, and *vice versa*.

The patient informed me that for five weeks she had taken minute doses of hyd. bichlor., with some of the other remedies prescribed by me. Subsequently she was advised to try the effect of strychnia. She stated also that she was totally blind three weeks, and absolutely color-blind three months. As Mrs. S—— possessed a very delicate perception of tints, as she was totally color-blind, and as she watched with solicitude and curiosity her recovery, her own account of returning sense of color is interesting. White and black were first distinguished. Familiar objects, the color of which was vividly remembered, all seemed alike tinted a peculiar light brownish yellow, described by the patient as "old gold" color. Both green and sunburnt grass and leaves, in fact all colored objects, presented this peculiar tint.

At the end of three months blue tints began to appear, then yellow, brown, and red, and finally green. Only till after five years was there power of distinguishing different shades of green. During the early stages of convalescence the patient experienced peculiar vivid subjective flashes of light, after each of which was quite a rapid increase in the perception of color.

2. *An eyelash in the anterior chamber.*

Mr. J. A. B., a German farmer, 36 years of age, while standing near a threshing-machine, received a punctured wound of the right cornea from a short piece of straw. The patient withdrew the

piece and found himself almost entirely blind. Little suffering followed the accident.

Nine months after this the patient came under my care. The left eye was atrophied and blind from childhood. The right eye presented a slight pericorneal congestion—a small cicatrix at the upper and outer portion of the cornea a couple of millimetres below the periphery—and an opaque lens, to which was attached the upper perforated portion of the iris. The remainder of the iris and pupillary border was normal in appearance. There was a very little photophobia, but no pain nor tenderness. In the anterior chamber could be readily perceived an eyelash, its large end lying behind the limbus of the conjunctiva four or five millimetres below the horizontal meridian. The other end was in contact with the cicatrix of the cornea and possibly embedded in it. The lash was considerably curved, its convexity being turned toward the pupil.

As it lay in the temporal portion of the chamber, its removal was easily accomplished by means of a small blunt iris-hook, introduced through a short incision at the periphery of the cornea. By a subsequent iridectomy and extraction of the soft cataract with portions of the capsule, excellent vision was restored.

MASSAGE IN DISEASES OF THE EYE.

By Dr. HERMAN PAGENSTECHER, of Wiesbaden.

Translated by James A. Spalding, M.D., Portland, Me.

IN this paper I propose to communicate my experience with massage of the eyes in recent years. Having previously called attention to this procedure (*C. f. A.*, 1878, Dec.) I feel compelled to publish the practical results which it has procured for me. In the course of time I have greatly modified this process and extended its use to a larger series of diseases, in order to assure myself, in the first place, how far we can employ it without doing any injury to the eye; and further, what results it has upon vision, upon various inflammatory processes, etc. I am convinced that I have by no means exhausted the subject, but as I have already gained certain positive results, I will delay no longer in communicating them publicly to the profession. Perhaps they may succeed in inducing others to try massage, so that we shall all the sooner gain more decided and accurate indications for its proper application in diseases of the eye.

Before describing the method in detail, I will merely mention that, so far as I know, nothing was ever published on this subject in ophthalmological literature previous to my first paper. Gradenigo, however, says (*C. f. A.*, 1880, p. 123), that massage was known long before my publication, and even in ancient eras. But unfortunately his assertion has no foundation in historical facts. Donders is the only one, in my opinion, who has ever mentioned the subject in ophthalmological circles. Indeed, he brought it up as far back

as the International Congress in 1872, although by some mistake his remarks were never incorporated in the printed Transactions.[1] So far as my memory supports me, Donders spoke of the favorable action of massage in general, and suggested that its use be tried in ophthalmology, especially in opacities of the cornea, but he did not mention any special results that he had obtained. In spite of this urgent suggestion, nothing was said about the subject for several years, and I do not even know whether Donders himself ever published any experiments or observations. My attention was again called to the method in question by the case which I have published in detail (*l. c.*, p. 281), and which interested me exceedingly by the diminution of tension which followed the use of massage. Soon afterward I saw it produce a most brilliant result in a form of chronic episcleritis with frequent relapses, so that ever since I have given further and more careful attention to this remedy.

I must first speak somewhat at length in regard to the manner in which massage of the eye is to be performed. We first press lightly against the edge of the upper or lower eyelid, as the case may be, with the thumb or forefinger, and then rub the lid as rapidly as possible to and fro over the eyeball, either in a radiating or circular direction. The former motion is the more valuable of the two, and the one which is to be resorted to in most diseases. By radiating motion, I mean that we push the eyelid over the eyeball, from the centre of the cornea toward the equator in every direction. We can thus massage any given sector, and by gradually changing the direction, apply the desired motion to the whole circumference of the eye. I must especially emphasize this point; that the rubbing is to be done as rapidly as possible, but without exercising any heavy pressure on the eyeball. The finger must, as it were, fly over the eye, a manœuvre which is soon perfected by practice, and which seems to me to be of the greatest importance in obtaining favorable results. The circular method consists in rubbing the upper lid round and round just over the sclero-corneal junction.

[1] Compare *K. M. f. A.*, 1872, p. 302.

I was formerly in the practice of trying massage entirely alone, but soon accompanied its use with the application to the eye of the yellow precipitate ointment in various degrees of strength. I thus obtained such good results in affections of the cornea and conjunctiva, that at present I always use both remedies together. In the first place, we can apply massage so much better in connection with the ointment, on account of the greater flexibility of the mucous membrane thus obtained; while in the second place, we cannot deny or depreciate the specific therapeutical influence of the ointment in these affections, increased as it is by massage. I use an ointment of from one to ten per cent. with vaseline, according to the severity or nature of the disease. In my experience, vaseline reduces the irritating properties of the yellow precipitate much more effectively than simple cerate, or the other common fatty vehicles. But we must be *sure that the ointment is rubbed up most carefully;* the high-power microscope must not reveal any of the reddish-yellow granules of the yellow oxide. I generally employ massage only once a day, but sometimes twice, if it is particularly well borne. The treatment of any one special district on the eye, which is generally all that is demanded, hardly lasts longer than a minute or two, but of course, if there are several spots to be subjected to massage, the treatment lasts proportionally longer. I have never used massage several times a day, as recommended by Van der Laan,[1] and therefore cannot speak of its practical value or suitability.

The essential action of massage, especially its application in the radiating direction, consists in the complete evacuation, for some considerable period, of all the blood and lymphatic vessels, both coarse and fine, around the sclerocorneal margin, as well as in the tissue of the cornea itself. In this way, the vessels in question gain greater capacity for absorbing whatever exudations may be present, and we can even go so far as to imagine that the latter may be led into the current of blood, and even eliminated from the eye in a purely mechanical manner. At the same time, we are exer-

[1] *Periódico de Oftalmologia practica*, March, 1880.

cising an irritation upon the vaso-motor system, and thus exciting better contraction on the part of the vessels.

The very fact that we sometimes notice an undeniable decrease in the tension of the eyeball shortly after the use of massage, proves that the influence of this procedure is not merely transitory, but that it really removes and keeps away from the eye, for some considerable period, a certain quantity of fluid. The influence in question is most intensely marked in the scleral and subconjunctival (episcleral) vessels, for they are the easiest to evacuate, while the superficial conjunctival vessels especially are but slightly affected. While massage acts in some cases as a distinct depletive, in others it acts as an irritant, especially in those torpid processes in which we have to induce the formation of new vessels, and so contribute directly to the absorption of exudations.

These considerations have already partially shown the indications for the use of the procedure in question; *i. e.*, it is chiefly in the chronic affections of the eye, and above all in the chronic affections of the cornea, conjunctiva, and sclerotic, that we shall gain the most beneficial results from massage.

The chief groups of disease in which I have found massage of most benefit are: 1. Affections of the cornea; 2. of the conjunctiva; 3. of the sclera; 4. of the ciliary body.

The most frequent *affections of the cornea* are those superficial, or deep, and generally extensive opacities of the cornea so often observed after the so-called pannous keratitis, or scrofulous superficial keratitis, or even parenchymatous keratitis. Such opacities generally rest quite stationary, the cornea becomes less and less vascular, and is often entirely free from vessels; but in spite of that, the opacity does not clear up, and the process seems entirely to have terminated. Although we occasionally gain very marked results in such cases by the use of warm and moist compresses, or the application of the so-called clearing remedies, such as yellow precipitate ointment, calomel, tincture of opium, etc., yet massage surpasses them all in the benefit, and above all in the rapidity of its action. The

chief point in many of these cases is simply to excite a moderate vascularity in the cornea, and it is in producing this result, especially in those cases in which moist applications are contra-indicated, *e. g.*, persistent granular conjunctivitis, that massage acts like a charm. We have only to take care to stop at the right moment, and then to resort to less active remedies. The vascularization of the cornea must only be excited to a moderate degree, and the irritation produced by the massage must not continue too long. It must wholly disappear within half an hour. I have also seen a rapid improvement toward transparency in opacities which had lasted for years, of which the following case may serve as an example.

A lady, æt. 44, who had undergone severe and repeated scrofulous inflammation of the eyes in her early years, consulted me on account of a slight pustular conjunctivitis of her left eye. Vision in both eyes was very much diminished by extensive, irregular, dense and deep-seated corneal opacities. Right eye: S $\frac{5}{50}$. Left eye: S $\frac{5}{100}$. The patient said that her vision had remained unaltered for twenty years. I applied the yellow ointment, and began at the same time with massage of the left eye. The pustule disappeared in a few days, while the patient declared that the vision of the left eye was improving from day to day, and that she now saw much better with it at a distance than ever before. After twenty-five sessions of massage, S $\frac{5}{50}$. The right eye was not subjected to massage, because its corneal opacities were less diffuse but deeper seated, while intervening portions of the cornea were relatively clear.

Massage is useful in the following *affections of the conjunctiva:*

1. The chronic forms of pustular conjunctivitis, especially in patients advanced in years.

2. In a form related to pustular conjunctivitis, which is almost always located at the margin of the cornea, and is characterized by the formation of a yellowish wall often entirely surrounding the cornea, in which we see a few scattered reddish elevations about as large as the head of a pin. The process shows a tendency to invade the margin

of the cornea, so that even after recovery from long-standing cases we always find a slight marginal opacity in that region. These cases are remarkably obstinate, show a great tendency to relapse, and often seem to resist all remedies. Saemisch entitles this affection spring catarrh, a name which seems to us unfortunate, because the catarrhal symptoms are almost always slight, and the affection—in our neighborhood at least—is observed not only in spring, but in the summer and autumn. Our observations seem to show that the disease in question is rather confined to distinct regions than to distinct seasons, and that it principally affects the dwellers in low valleys.

We usually designate this affection as chronic pustular conjunctivitis, although I grant that even this title is not quite correct, and that Saemisch is perfectly right in differentiating this form as a special one by itself. Still, I cannot quite agree to the name "spring catarrh." Hypertrophic marginal conjunctivitis or keratitis were perhaps the more appropriate name. Saemisch advises us to avoid all irritating treatment, but my observations tend to show that the most obstinate forms may be rapidly cured by massage (twice daily), in conjunction with the *strong* precipitate ointment (10 per cent.).

3. In the hypertrophic form of pustular conjunctivitis, by which I mean that form which generally appears near the corneal margin in the shape of a thick, elevated, and extremely vascular papule, sometimes as large as a split pea, toward which large veins generally course from the conjunctiva. It bears some resemblance to certain forms of episcleritis, only the whole nodule can be pushed to and fro upon the sclera, while its summit is usually covered with a larger or smaller ulcerating surface, which upon closer observation is seen to be slightly granulated. In this form also, massage, twice daily, together with the yellow ointment of the usual strength, is very beneficial.

4. In a form of conjunctivitis which is chiefly caused by external influences, and is usually located upon the conjunctiva of the eyeball, in the fissure of the eyelids. The inflammation generally assumes the shape of a triangle, with

its base lying at the outer (rarely at the inner) margin of the cornea, while the apex is directed toward the external canthus. The conjunctiva appears slightly swollen, deeply infiltrated with a grayish yellow tinge, while both the conjunctival and subconjunctival vessels are swollen over the entire affected portion. The process varies in intensity, but even at the best, the conjunctiva is never entirely free from the morbid injection. External influences, such as dust, smoke, etc., almost invariably produce a violent attack, which usually lasts a long time before recovery ensues. I have repeatedly seen this disease amongst soldiers. In one case, the affection lasted seven years, with varying intensity, until massage brought about a perfect cure.

Amongst the *diseases of the sclera*, I have found two special forms of scleritis or episcleritis, in which massage has been of great benefit. One form is that which appears acutely, with the formation of nodules in the scleral or episcleral tissue, and is sometimes accompanied with severe ciliary neuralgia. The nodule is usually situated near the corneal margin, but sometimes as far away as the equator of the eye. The overlying conjunctiva, as well as the adjacent and underlying sclera, is generally more or less injected. When pressure is made upon the elevation, and the vessels evacuated, we notice the yellow or grayish tint very clearly, and gain a much better idea of the extent of the nodule, which evidently lies in the scleral or episcleral tissues, for it cannot be moved when we push the conjunctiva to and fro. The nodule is usually as large as a small pea or bean. This disease may often be ascribed to some specific affection. It is extremely obstinate and often lasts quite unaltered for months. In many cases we may obtain a complete recovery, but in others, where the nodule had penetrated deeply into the scleral tissues, and where the accompanying vascularization was exceedingly pronounced, permanent alterations remain in the shape of bluish discolorations with or without staphyloma of the sclera. The process shows an extreme tendency to relapses, and we sometimes have a chance of seeing a fresh nodule appear in the sclera (close to the old scleral patch which has almost disappeared), which

has become bluish, but is still covered with more or less varicose vessels.

I have only used massage in such cases of this form as were entirely free from inflammatory symptoms on the part of the iris, and always in conjunction with the yellow oxide ointment of the usual strength. At the same time, I have always insisted upon such constitutional treatment as seemed indicated. Although my experience with this disease is but slight, I am sure that I have sometimes succeeded in hastening an absorption of the nodule by the treatment just mentioned. The operative treatment of episcleritis by scraping out the nodule, as recently suggested by WICHERKIEWICZ, deserves great consideration, but experience must show whether we may not thus directly favor the origin of subsequent staphylomatous processes, or even produce them by the operation.

Under the second form of episcleritis in which massage acts exceedingly well and oftentimes with surprising success, we include those cases of chronic episcleral inflammation which, without excessive thickening of tissue or irritation of the iris, lead, in the course of time, to permanent alterations in the scleral structures. My experience extends only to those cases in which the process had lasted for a long time, and already led to alterations in the sclera; and further to those cases which appeared to be relapses after previous recovery from inflammation. In all these cases, however, massage acted so well that a decided improvement was visible after two or three sittings. Indeed, it was the surprising success in one of these cases that led me to try this remedy in other affections. I have used massage alone in this particular form, still I believe that in some cases the yellow ointment might additionally be resorted to. I have had no experience with quite fresh cases of episcleritis unaccompanied with the formation of nodules.

I can report only a single case of the use of massage in *affections of the ciliary body.*

A lady, æt. 28, had suffered seven years before from episcleritis, with frequent relapses, which I had at first treated with sudorifics and subsequently with injections of corrosive sublimate. The

patient had for a few years been free from relapses, but there was still a circumscribed spot in the upper part of the sclera near the ciliary region, which was always deeply injected in the morning, and extremely sensitive to the slightest touch. At the same time, all continued efforts at accommodation were impossible, for after every attempt the spot became red and painful. This peculiar condition had remained about the same for years, varying of course in intensity. I assumed the presence of a circumscribed exudation around the trunk of a ciliary nerve, and thereupon began to treat the spot locally by massage. I usually did it without the ointment, and at first very gently on account of the excessive tenderness. The success of the method began to show itself in a few days, the tenderness disappeared by degrees, the injection was no longer visible in the morning, and after a fortnight all morbid symptoms had disappeared, the spot being neither injected nor sensitive to pressure. The patient had a slight relapse about two months later, but this in turn disappeared in eight days, after having already lasted a fortnight before I saw it. The action of the massage showed itself much more distinctly than before, since the injection and tenderness over the affected spot disappeared after two sittings which I only continued longer for greater security. I have called this case a circumscribed affection of the ciliary body, on account of its circumscribed appearance in the ciliary region, the excessive tenderness to pressure, and the accompanying symptoms of asthenopia. It evidently arose from an exudation near some nerve, or in a nerve sheath, and was plainly a secondary affection, after a previous attack of episcleritis. I cannot tell how much permanent improvement was noticed in the asthenopic symptoms (which began to diminish after the first resort to massage), owing to the fact that I have not since seen the patient.

In briefly summing up my experience with massage, I must say that I regard it as an advanced and important remedy in ophthalmological therapeutics, for it not only helps to a more rapid and certain recovery than other remedies hitherto employed, but it has proved of great avail in several cases in which all other remedies had entirely failed, or could not be employed on account of various complications. I have found it most useful in chronic inflammatory processes in the anterior segment of the eye. I have never

seen it lead, at a later date, to any deleterious results. In the acute inflammatory affections, massage can only be resorted to with great reserve. It is absolutely contra-indicated in all those cases—not accepting even chronic inflammatory cases—in which it causes considerable, permanent, and excessive injection, and especially where the iris shows signs of irritation, as photophobia, lachrymation, etc. I have never used it in cases with genuine iritic symptoms.

In conclusion, I would remark that so far as regards the use and the duration of massage in ocular therapeutics, we must be chiefly led by the existing condition of the eye and the subsequent reaction. Moreover, we must not be too sanguine in expecting a perfect cure from this remedy alone in all the morbid processes above mentioned, and especially in affections of the cornea. Although we may thus cure almost all of the above forms of conjunctival and scleral affections, we cannot say as much for those of the cornea, for, in the latter, massage, in a large majority of cases, is only applicable in certain stages, in which, however, when resorted to in season, it often effects surprising results.

ON MASSAGE IN OCULAR AFFECTIONS.

By JAMES A. SPALDING, M.D., Portland, Maine.

WHILE translating H. Pagenstecher's paper "On the Use of Massage," etc., one or two ideas suggested themselves so strongly to my mind, that I will venture here to make a few remarks upon the subject.

I think that some of the cures reported in the paper in question are rather to be referred to the use of the yellow ointment than to massage of the eye; indeed, I have seen such fine results, such perfect cures after the application of the ointment referred to, that I now use it, and have used it for a number of years, with great confidence in its action. In a large majority of cases it has never left me in the lurch. The chief objection to its use is the carelessness with which the apothecaries sometimes prepare it. I have once or twice known a poorly-rubbed-up ointment (*even of one per cent.*) to cause the most acute pain, lasting for hours, while, having taken care to send the complaining patient to a more thorough apothecary, no pain has followed the application of the new ointment of the same strength. Another objection, but hardly of importance enough to mention, is the greasy look which the ointment gives to the eyelids soon after its application. Some of the more elegant patients object to it on that account, but that seems to me of but little weight when we consider that the affections of the eye in which the ointment is to be used, demand more or less seclusion on the part of the patient. Finally, there is objection to the ointment on account of the difficulty of applying it, but that can be easily overcome by showing the patients the correct way, as is always my custom.

All reported cases of the cure of those forms of episcleritis, or scleritis, in which we have a distinct elevated nodule, whether by therapeutical or by surgical treatment (scarification, scraping, etc.), are to be taken with a grain of salt. Sooner or later we have a relapse. The sclera, once affected, seems never to be free from the danger of a relapse whenever any external cause affects the general system. Rheumatism, syphilis, gout, exposure to draughts, to cold or rain, a small cinder in the cornea, or even under the upper lid,—causes which, in healthy eyes, might at the worst lead to quite different types of disease,—all lead to relapses in those patients who have unfortunately once had an attack of this form of episcleritis. We may cure them in one way or another, but we always have relapses. I have one patient whom I have *cured* at one time with zinc chloride (0.03:32.), together with the internal exhibition of salicin. At another time the same remedies have been useless, but I have *cured* the relapse by scarification. At still another, scarification has failed, but scraping has been of avail. Finally, at a fourth or fifth relapse, all the above remedies have been resorted to without avail, but the attack has finally been relieved by the use of large doses of quinia; in other words, the case, as well as each relapse, has probably recovered of itself.

My experience has undoubtedly been similar to that of other oculists, but as they have failed to mention their results in cases of long-standing, with repeated relapses, it seemed right for me to put mine on record so far as concerns this obstinate affection.

But what I desired chiefly to state, so far as regards massage in ocular affections, is this: I have had some trifling experience with this procedure, but could not see that it hastened a cure in cases which were progressing fairly well under the use of the yellow ointment, or suitable astringents. I was led to use this method by the reported cure of one or two cases of scrofulous ophthalmia (which had been under the charge of many physicians for a long time without decided benefit), under the treatment of a so-called "magnetic physician." I saw the cases (in children each time) when

cured, and can only say that the patients seemed permanently well, *There was no trace of any corneal affection visible!* The parents said that this doctor sat in front of the child, placed his thumbs, or sometimes his fingers, on both eyes simultaneously, and then rubbed the eyelids over the eyeball rapidly, and for some length of time. An improvement was gradually witnessed, the sight increased, and after about twenty sittings the children's eyes were as strong and healthy as ever. The doctor in question did not claim to know any thing about the eye, but said that he cured all diseases by "magnetism." To me, however, it seems plain, as it will undoubtedly to my readers, that these two cases were probably cured by massage, for, during this treatment no remedies were applied to the eyes. I will mention further, that the parents of a child under my charge for specific keratitis, being dissatisfied at the slow but sure progress of the case, took her to this doctor for treatment, which, after about twenty sittings, left the eyes worse than they were before. This would go to show the truth of Pagenstecher's remark, that corneal affections are more rebellious to massage than those of the conjunctiva or sclera.

In an historical point of view, Pagenstecher seems to me to be in the wrong in denying that the ancients resorted to massage. It is impossible for me to lay hands at this instant on any exact reference to this subject, but having within the past year looked carefully through the history of ophthalmology, I am confident of having somewhere seen old accounts of the cure of diseases of the eye *by rubbing them.* And Bartisch, in the sixteenth century, certainly speaks of curing weak and filmy eyes by rubbing them. He even goes so far as to say that in certain cases we should rub toward the inner corner of the eyes; in others, toward the outer corner. Moreover, it is a well-known popular idea, that rubbing weak eyes in certain directions cures them; and whatever is popular is generally ancient, as, for instance, the use of woman's milk in sore eyes of children, a remedy as old as the human race. Of course, in an exact point of view, the question may be raised, whether "rubbing the eyes" in certain directions is the same thing as massage of

the eyes. For myself, I cannot see any extraordinary difference between the two methods. Nor, in the limited use which I have made of massage, have I noticed any difference in the results gained by the radiating over the circular method. Finally, if we want to know whether massage of the eyes is a beneficial remedy or not, it seems most urgently necessary that we should resort to that alone (*i. e.*, without the yellow oxide ointment) in order to decide upon its merits in any given case.

DESCRIPTION OF A COLOR-SENSE MEASURE.

By CHARLES A. OLIVER, M.D., of Philadelphia.

I HERE desire to bring before the profession a contrivance designed mathematically to determine color-sense.

About two years ago, after much unsatisfactory use of a few styles of measures, I determined to try to obtain a more reliable instrument, and after planning many models and undergoing many disappointments, I succeeded in obtaining this form, which, I think, with *perfect construction*, will perform all it claims.

It consists merely of a blackened perforated disc, in which there is inserted a movable graduated slide; the disc is then bolted to two circular cards, upon which are placed known colors.

Now, by the rotation of these color-bearing cards and the movement of the slide, we can accurately determine the exposed area, the amount being registered by the graduated strip on the face of the slide.

This strip has upon it an artificial division of the *diagonal* of the entire color square into nine equal parts, each divided into ten equal parts.

Each of the *sides* of the color square is equal to ninety millimetres (nine centimetres), and as the strip measures the diagonal, we, by this measure, possess an absolute answer for the *actual increase of the side of the square in millimetres.*

So if, by reference to the strip of artificial divisions, we find a certain area of color to be first perceived when the

strip is at its twelfth division, we know that we have reached a point on the side of the square equivalent to twelve millimetres.

On the back of the contrivance there is placed a scale of comparative values in millimetres, one-sixteenth of an inch, dioptries, and feet, which will be found useful for ready comparison.

The three primary colors and blue have been placed on the first card. The second card has been added, as it is deemed important to have a series of confusion colors in cases of color-blindness, these colors not being theoretical, but actually chosen by a well-marked case.

The amount of color perceived is designated in the same way as we do type, using the numerator for the distance used, and the denominator for the area seen.

By this instrument we are enabled in a few moments to almost accurately determine the amount of color-sense perception for some of the principal colors; of course others could be added, but these are thought amply sufficient for all practical purposes.

R. and J. Beck, of this city, have undertaken its manufacture, and as yet, comparatively few having been made, and these by hand, I find they are not absolutely perfect in action, although sufficiently accurate to be of great value.

ON THE LOSS OF SIGHT IN YELLOW FEVER.

By Dr. JUAN SANTOS FERNANDEZ, of Havana, Cuba.

Translated from the Spanish original by Dr. A. M. Fernandez, of New York.

IN the best monographs that have been written on yellow fever scarcely any mention is made of the symptoms which relate to the ocular apparatus. After pointing to the beginning of the fever, and to that state of general reaction, or *coup de barre*, marked by epigastric uneasiness and tumultuous beatings in the cœliac region, a passing notice is only made of the dilatation of the pupil, which, however, is so marked that it gives to the face a vague and indefinite expression, very similar to that assumed by a drunken man.

Toward the end of the first day, or at the latest, on the second day, our attention is attracted by the hyperæmic condition of the face and eyes. The eyes appear red, lachrymose, and very brilliant; the authors of monographs on yellow fever allege that, these symptoms on account of their constancy, are of considerable importance. In the second stage of the fever, called "the stage of localization," and which, as we all know, commences by a remission of the fever down to 38° C., the redness and brilliancy of the eyes are diminished; at the same time the rosy color of their tegumentary covering disappears, and the manifestations of icterus commence to be evident, being noticeable in the sclerotic before they are appreciable in the skin.

Nægeli, speaking of the hemorrhages in yellow fever, says: "The ocular and auricular hemorrhages are extremely

rare, and the quantity of blood is always insignificant." Bérenger Féraud in his work entitled "La Fièvre Jaune au Sénégal," [1] describing the symptoms of the first stage, says: "The eyes are billiant, the conjunctiva slightly injected, varying in color from a pale rose to a bright red, is wet, and does not present the hyperæmie aspect which is so marked in the more advanced stages of the disease." He adds: "In the second stage the eyes appear as in the first; and it has been thought that there is a direct relation between the intensity of the coloration of the conjunctiva and the severity of the disease; but although this assertion is not entirely correct, it can properly be stated that it is a sign of great importance, and one which the practitioner must not disregard in framing his prognosis." In yellow fever, as in many other diseases, there are certain peculiarities, and even anomalies, which ought to be taken into consideration in order to avoid absolute conclusions. The congestion is generally very marked, and it is not altogether impossible for an inflammation to supplant this primitive hyperæmia. Thus it becomes necessary that the practitioner should only consider the primitive hyperæmia for his prognosis, for when the inflammation follows it, the redness increases in intensity without any corresponding increase in the severity of the disease. The proof of our statement is that those cases in which a true inflammation *is* present, and accompanied in some of them by suppuration (always a symptom of the third stage), are not necessarily fatal. Further on, speaking of the prognosis, the above-named author says: "Catel and Chevé have noticed the coloration of the conjunctiva, and the peculiar expression which it gives to the patients. Menu-Dessables and Dupuis also spoke of that fact in 1837, and M. Bel, in 1859, called the attention of the profession to that congestion of the eyes, having observed the fact, he says, that when the conjunctiva is finely injected and has a bright red color, the disease is extremely grave, while when the congestion is diffuse the patient is in less danger. He pretends to base on this variation the differential diagnosis

[1] Paris, 1874.

between yellow and malarial fevers, affirming that in the latter the coloration of this mucous membrane is never present. Cédout, who has very carefully observed all the symptoms of his yellow-fever patients, was aware of that fact, and also noticed the red and lachrymose aspect of the eyes at the beginning of the attack, particularly in patients recently arrived from France. Mery also paid some attention to the same fact in 1867.

More recently (1878) Bérenger Féraud, in his work named "La Fièvre Jaune à la Martinique," in speaking of the symptoms of the second stage, lays great stress on the brilliancy of the eyes, their lachrymose condition, the fulness and nicety of the conjunctival injection, the dilatation of the pupil, and the presence of photophobia, adding that this congestion is diminished during the remission of the fever if the attack is not severe, but that if the conjunctiva darkens and assumes an icteric aspect, which becomes more and more intense, the case is undoubtedly severe. He has observed that in some grave cases ocular hemorrhages occurred during the second stage, producing subconjunctival suffusion, or a flow of blood from the neighborhood of the commissure of the eyelids. In another chapter of the same work, speaking of these hemorrhages, he says: "They have frequently caused conjunctivitis, keratitis, and even such an accident as a phlegmon." Griesinger is the only author that mentions the diminution or complete loss of sight in yellow fever, by saying: "Amblyopia or amaurosis is rare in yellow fever."

As it can be seen by these extracts which we have made, after a careful perusal, from the late monographs on yellow-fever, their authors do not point out any other ocular symptoms than external ones relating to the conjunctiva and cornea, which we also have occasionally noticed. We have observed, too, the phlegmon of the eyeball, which appeared in both eyes in the case of a patient in one of the hospitals of Havana.

The partial or complete loss of sight without any visible pathological lesion, as a concomitant in yellow fever, is a point that has not yet (to our knowledge) been brought be-

fore the profession; and as the cases which we purpose to cite have appeared to us to have some interest on that account, we have thought them worthy of record in some clinical journal, whatever be the knowledge we derive from it at present.

CASE 1.—Don Y. S. P., student at the Military Academy, entered Garcini's Hospital about August 24 or 25, 1879, suffering with an attack of yellow fever already on its second day. This young man was a native of Andalusia, Spain, 19 years old, of a good constitution, and no hereditary taint; had arrived in Cuba perfectly healthy the year previous, and in the best season—the latter part of December. The disease began to develop in an insidious way, without any alarming symptom whatever, the fever heat scarcely reaching 39° C., the pulse not over 100; and although albumen was found in the urine, it was in a very small quantity. An emetic of ipecacuanha was given soon after his admission into the hospital. The next day the symptoms continued the same, and a purgative of 40 grammes of sulphate of sodium was given. The third day the albuminuria increased considerably; the restlessness of the patient, as well as his greater stupor and increased temperature, attracted the attention of Dr. Gordillo, attending physician. An enema of castor oil was administered, and tartaric acid lemonade ordered as ordinary drink. On the fifth day new symptoms established beyond doubt the severity of the attack, for there was suppression of urine, hiccough, muttering delirium, and complete loss of vision, which was detected by his asking during lucid intervals if it was night or day, and only being able to recognize his relatives and friends by their voices. Doctors Soler and Ruiz Sanroman, of the Spanish navy, were called in consultation by Dr. Gordillo. They all fully agreed in the severity of the disease, and decided to give revulsives, tonics, and excitant diuretics. Twenty-four hours after this treatmentt the flow of urine was resumed, vision reappeared, and the cerebral symptoms ceased.

The lack of an ophthalmoscope prevented Dr. Ruiz Sanroman from examining the eye on his first visit, and when he brought one with him on his second visit he found the patient had recovered vision, and, performing the examination, could not then discover any morbid condition in the interior of the eye.

The patient continued improving, and entirely recovered without any further symptom, excepting a parotitis of the left side.

CASE 2.—M. R., sailor, native of Galicia, Spain, 35 years old, and of a good constitution, was taken sick with yellow fever on board a steamer, and admitted to the Navy Hospital at Gibara (Cuba), in the August of 1876. The disease was already on the fourth day, and the high temperature taken in the axilla, the large amount of albumen in the urine, and the presence of delirium, induced Dr. Ruiz Sanroman, director of the said hospital, to form a very unfavorable prognosis. The next day, *i. e.*, the fifth of the attack, the adynamic symptoms increased in severity; there were profuse hæmatemesis, additional cerebral complications, anuria, and amaurosis, the patient dying that very night.

Dr. Ruiz Sanroman was not able to examine the eye with the aid of the ophthalmoscope, for there was none available in the hospital under his charge; but he tells us that in a report he presented to the Board of Health of the island, he states the fitness of examining the interior of the eye in patients who, suffering from yellow fever, should show ocular symptoms, for he had noticed during that year (1876) two instances of amaurosis in conjunction with anuria.

CASE 3.—The Rev. M. M. H., Doctor of Laws, born at Gerona, Spain, 34 years of age, and of a good constitution, arrived at Havana in the latter part of the year 1880, in company of other priests and the Right Rev. Bishop of this diocese. Several of those priests died victims of yellow fever, the last of which was the secretary of the bishopric, and a dear friend of the patient. Rev. M. M. H. was so affected by the loss of his colleague that he remained in the cemetery near the tomb of his friend for several hours after the burial, profoundly afflicted. We ought to state that Rev. M. M. H., as well as the deceased secretary, the bishop, and the other priests, had come over from Spain to fill the vacancies caused by the yellow fever. The next day after the funeral, Rev. M. M. H. felt so sick that notwithstanding his energetic efforts to avoid it, he had to take to his bed. Dr. Gutierrez Lee was summoned on the 20th of September, and found the patient lying on his back, restless; the face flushed; pupils rather dilated; the tongue as if it were elongated, tremulous, gray at the middle and red at the sides; disagreeable taste in the mouth; intense thirst; nausea; the skin hot and dry; pulse depressed and hard, with 108 pulsations; respiration free; there was rachialgia, and also cephalalgia; temperature, 37.08°C.; small quantity of urine, which was red and without albumen. A purgative of castor oil

was administered. In the afternoon melanic vomiting. Tartaric acid lemonade as ordinary drink, and compresses of cold water on the forehead, were ordered. During the night there was complete wakefulness, seeming increase of cephalalgia and rachialgia ; the patient fatigued, weak, and constipated; the face continued flushed, and the tongue dry. A purgative enema was prescribed.

On the second day the eyes appeared injected and lachrymose; the tongue as in the first day ; there was stupor, a hyperæmic condition of the skin of the face, delirium, and greater restlessness. He still could recognize people. The urine continued scarce; there was great thirst ; pulse, 110 ; temperature, 39.09°C.; melanic vomiting. Purgative clysters were ordered again, and small pieces of ice to be held in the mouth. At about 3 A.M. the third day, all the symptoms of the second day were increased, particularly the delirium and restlessness, the scarcity of urine being converted into a true anuria. The attendants noticed the loss of vision.

When we were called at about 12 o'clock that morning to examine the eyes, we found the patient in a violent delirium. The conjunctiva was injected, and presented an icterical tint similar to the one that was in the cheeks. The pupils, although not contracted, did not allow the ophthalmoscopic examination, the restlessness of the patient making it still more difficult. Twenty minutes after the application of atropine the pupils dilated, and although there was a great deal of trouble to keep the patient still, we succeeded in examining the interior of the eye, and satisfied ourselves of the absence of any abnormal condition.

During the evening of the third day there was a slight remission of all the symptoms, but the amaurosis continued. Early in the morning of the fourth day, and after a violent attack of delirium, frequent vomiting, and a very offensive melanic passage, the patient had two successive syncopes, and died at six o'clock that morning.

A CASE OF LEFT-SIDED BINOCULAR HEMIANOPSIA, WITH REPORT OF AUTOPSY AND MICROSCOPICAL EXAMINATION.

By E. H. LINNELL, M.D., of Norwich, Conn.

THE following case was under observation for a period of nearly two years. Its clinical history and *post-mortem* examination seem to be of sufficient interest to warrant publication.

Mr. T., æt. 63, of nervous temperament and thin habit, first consulted me for failing vision in November, 1879. His avocation had been that of a photographer until ill health, which he attributed to the constant handling of chemicals, obliged him to relinquish it. Inquiry elicited the following facts. For the past eight or nine years he had been subject to frequent attacks of neuralgia affecting his head and limbs; he had been habitually constipated; his urine had been somewhat increased in quantity, light-colored, and passed frequently; and for four years he had had paralysis agitans affecting his right arm and leg, but more markedly the arm. This tremor developed gradually, and was attended with partial anæsthesia, denoted by numbness and tingling sensations in the affected limbs, and by general debility. In other respects he enjoyed good health until the fall of 1879. During the night of September 27th of that year, he had a sudden severe attack of pain in the head, extending from vertex to chin, accompanied by total blindness, and followed by vertigo, nausea, and slow pulse. Digitalis was prescribed, and after twenty-four hours the intensity of the symptoms was moderated, and his sight began very gradually to be restored, but was never fully recovered. He continued to suffer with neuralgic headache and vertigo, and

his gait became halting and uncertain. His mental faculties, however, remained unimpaired, and the paralysis agitans, or the difficulty of locomotion, did not increase. When I first saw him, V O U = $\frac{20}{30}$, refraction Em. He had, however, left-sided binocular hemianopsia. The pupils were markedly contracted, and he would not consent to the use of a mydriatic. Shortly after atropin was employed and a thorough ophthalmoscopic examination was made. The retinal arteries were somewhat contracted, but in all other respects the condition of the fundus was normal. His health remained the same, and his sight improved slightly under the use of phos., but in the latter part of April, 1880, he had another sudden attack of complete blindness. This attack was unattended by pain, and was of shorter duration than the first. Central vision was again restored to $\frac{20}{30}$ or $\frac{20}{40}$, but the left half of the visual field was still wanting. The ophthalmoscope now showed, in addition to the contracted vessels of the fundus, a pallor of the *right* side of the *left* disc. The patient consulted me for the last time in September, 1880, at which time no material change was apparent, either in his general condition or in the state of his vision. For the subsequent history of the case I am indebted to his family physician, Dr. J. E. Linnell, and to his wife. His sight seemed to fail gradually, until he could with difficulty distinguish large objects. He complained much of dizziness, but suffered less pain; walking became more fatiguing, the right leg especially seeming heavy and as if too long. He retained the use of all his faculties and could converse intelligently, although his mind seemed to lose some of its natural vigor. In the latter part of June, 1881, he was suddenly seized with a general tremor of the whole body, afterward becoming more pronounced on the right side. This was not attended with pain, and he apparently recovered from the effects of it, but had a similar seizure, July 2d, accompanied with constriction of the post-cervical muscles. The rigidity increased, he soon became unconscious, and was apparently entirely blind. After a few hours he partially regained consciousness, and had perception of light. He complained of illusions of vision, but could not distinguish objects near him. The following day he seemed somewhat more rational, his head was less retracted, and some improvement was noticeable in the clonic contractions of his arms. The visual fancies still annoyed him. His urine and fæces were passed involuntarily; he was very restless; his face was flushed, the veins of his forehead

and temples were very prominent, and his breath was fetid. From July 4th to 8th he seemed to improve somewhat. His mind was clearer and his expression more natural; there was less tremor, but a general restlessness continued. From this time he gradually failed both in intellect and strength until he became comatose, in which condition he remained for several days, and died July 19th.

An autopsy was held in the afternoon of the day of his death, with the following result:

The dura mater was so firmly adherent that the calvarium could not be removed without cutting through it, and in so doing, several ounces of dark fluid blood escaped from the sinuses. Both it and the arachnoid appeared healthy. The pia mater was much injected, the veins being distended with dark blood. The entire weight of the brain was 2 pounds 15½ ounces. The cortical substance of the cerebrum was of normal consistence, but upon section of the right hemisphere a large and firm coagulum was found in the medullary substance. It was nearly circular and measured approximately 4 *cm.* in diameter and 2½ *cm.* in thickness. It was situated a little anterior to the centre of the hemisphere, and did not anywhere encroach upon the cortical substance. The contiguous brain substance was softened for a thickness of about two lines, but the clot was removed almost entire, and there was no serum, pus, or other indication of inflammation or of extensive degeneration. No pathological changes could be discovered in the left hemisphere. The fluid in the ventricles was not appreciably increased in amount, although there was more serum upon the left than upon the right side. The velum interpositum and choroid plexuses of the ventricles were highly vascular, the veins being turgid and swollen, and this was more marked upon the left side. The tubercula quadrigemina were manifestly degenerated, and presented the appearance described as white softening. This condition was much more evident on the *left* side, but it was not limited to these bodies. It also extended laterally and anteriorly, involving the corpora geniculata, the posterior and inferior portions of the optic thalamus on the *left* side, and also, to some extent, the floor of the fourth ventricle. A portion of the left optic tract and the adjacent under surface of the thalamus was removed for microscopical examination. This was so soft as to require very careful handling to prevent crushing. The optic tract of

the right side seemed firmer than that of the left; the chiasm seemed normal, and also the optic nerves, which offered considerable resistance to the scalpel. The cerebellum appeared healthy, but the same superficial vascularity was noticeable as in the cerebrum.

The portion of the under surface of the left thalamus which was removed, I sent to Dr. John A. Rockwell of New York, to whom I am indebted for carefully prepared sections of the same, and for thorough microscopical examinations. These investigations were made for the most part in the laboratory of Dr. C. Heitzmann, to whom the doctor acknowledges indebtedness for valuable suggestions. In all preparations there were found small, bright, shining, globular bodies, homogeneous, and of high refracting power. They were sometimes isolated, sometimes in clusters, and again in strings running parallel to each other, or diverging and giving a fan-like appearance. The axis cylinders were first attacked by the morbid process, and later the ganglia and nuclear bodies.

In endeavoring to discover the nature of the degeneration, the following reagents were employed, viz.: oil of cloves, osmic acid, fuchsine, picrate of indigo, violet methyl aniline, hæmatoxylon, tincture of iodine, and chloride of gold. In all cases the normal protoplasm was stained, but the above-mentioned globular bodies remained unaffected. The ordinary fatty, calcareous, waxy, and nitrogenous reactions not being exhibited by these usual tests, the exact nature of the morbid changes could not be ascertained. It resembled the amyloid degeneration, but was not identical with it, and suggested the condition described by Dr. Emerson,[1] in the investigation of which he reached similar negative results.

[1] *Journal of Nervous & Mental Disease*, April, 1880.

A CASE OF FOREIGN BODY RETAINED IN THE IRIS FOR 19 YEARS.

By HENRY S. OPPENHEIMER, New York.

F. M., a gunsmith, æt. 60, came to me about 2½ years ago, while I had charge of Dr. Cutter's clinic at the N. Y. Eye Infirmary, to seek relief for a conjunctivitis. Examining his left eye carefully I found imbedded in the iris, near the lower margin of the pupil, a small black spiculum of some foreign substance, which had left an evident trace of its passage near the limbus, in the lower part of the cornea; had perforated the iris, and was permanently fixed by a firm web of connective tissue to the anterior capsule of the lens. The iris and foreign body seemed thus fastened by a strong band to the lens. The iris was of normal color; the pupil dilated promptly in every direction on the instillation of atropine, excepting at the point of adhesion downward and outward. The lens was clear; the point of the synechia was opaque only to the extent of the connective tissue band. V. L. E. $= \frac{20}{20}$, with + 60 sph. V. R. E. $= \frac{20}{20}$. Field limited only in direction of the adhesion. When questioned closely the patient stated that, while at work nineteen years ago, a piece of steel flew into his eye. An oculist who saw him on the day of the accident proposed to remove the foreign body, but other counsel prevailed. His wife and the family physician concluded that it was best not to let any one operate on the eye, and as the latter advice was more to his notion he followed it. Beyond a little pain the first few days the eye had never troubled him, and he had felt sure that the steel had never entered his eye. The eye is to-day in the same condition as when I first saw it.

TRAUMATIC SUSPENSION OF THE ANTERIOR CHAMBER, MYOPIA; RESTORATION OF THE ANTERIOR CHAMBER, ACUTE GLAUCOMA; CURED WITH ESERINE.

By H. KNAPP.

THE following case excited my interest so much that I think its report may not be tiresome to others:

Mr. B. H. M., 29 years old, of New York city, came to me on June 7, 1881. He had been struck with a cane on his right eye a few days previously, but experienced no particular pain. The only thing he complained of, was that he could not see well with that eye at a distance. I found no external lesion. The anterior chamber was empty, the iris and lens apparently applied to the cornea. The pupil was small, regular, responsive to light. The lens, vitreous and background of the eye were normal. The tension slightly diminished. The ophthalmoscopic image was bright and free from distortion. The patient read with that eye 0.25 at the distance of 17 *cm.* With—$\frac{1}{7}$ he read $\frac{20}{20}$ well. I advised him to bandage the eye, keep himself quiet, but use no remedy.

June 10.—Anterior chamber very shallow; iris and lens regularly pushed forward, as before, only not quite so much. Reads finest type at 20 *cm;* with—$\frac{1}{6}$ $\frac{20}{20}$.

June 18.—Iris less bulging. Fine type at 23 *cm*, with—$\frac{1}{10}$ $\frac{20}{20}$.

In the morning of June 19th he noticed that he could see far off again, but that every thing was misty. He had pain over the right eye and on the right side of the head. I found the outward appearance of the eye normal, the cornea clear, the anterior chamber fully restored, the iris angle as usual, the iris bright and

regular in relief, the pupil like that of the other eye. The lens in its proper position, showing no abnormity of transparency or curvature of surface; the vitreous, however, was hazy, and the fundus veiled. The retinal veins were dilated, but not tortuous, the arteries of the disc pulsated strongly; the eyeball tension was distinctly increased (+T1). S about $\frac{2.0}{200}$. Other eye normal in every respect. I ordered a drop of a half per cent. solution of sulphate of eserine to be instilled into the bad eye every three hours. The pain and dimness of sight increasing, he sent for me toward evening. I found his eye still harder, the pupil somewhat contracted, the turbidity of the vitreous increased, the cornea clear, the conjunctiva slightly swollen and injected, and the sight more impaired. I advised him to go to bed, instil the eserine every two hours, apply five leeches to the temple, and take morphia in 0,015 (gr. ¼) powders. He followed my advice faithfully, yet the pain continued increasing, until, after midnight, he had taken three powders, when it abated, and he fell asleep. In the morning he felt greatly improved.

When I saw him in the afternoon (June 20th), I found the pupil ad maximum contracted, scarcely one millimeter in diameter; the tension either normal or diminished (—T?). He read the finest type. Remedies discontinued.

June 22.—Has felt comfortable; thinks that he is well again. Reads 0.25 near, and $\frac{2.0}{2.0}$. Tn. Iris, pupil, and anterior chamber normal. No pulsation of arteries on optic disc.

June 24.—0.25 from 5″ to 15″; $\frac{2.0}{2.0}$; Tn. Interior normal. Has no inconvenience. Considered cured.

November 26.—Writes me that his eye has continued well, being as sharp and strong as ever before.

To explain this remarkable succession of symptoms does not seem to be quite easy; yet I will try it. First the suspension of the anterior chamber. In the last number of *Zeh. Klin. Mon.*, October, 1881, p. 384, etc., there is a similar case described by Prof. Schiess-Gemuseus under the title "Traumatic myopia; slow spontaneous recovery." The author explains the advancement of the lens and the consequent myopia by a relaxation of the zonula Zinnii in consequence of a concussion of the globe. I cannot consider this as more than a mere supposition, and a very improbable one, too; for let me ask, "Where, in these cases,

does the aqueous humor go"? Schiess says "that the shallowness of the anterior chamber could not be the result of an absolute increase of tension in the vitreous chamber, for the globe was soft; but it might have been possible that the concussion had altered the fountains of the aqueous humor, which probably lie in the ciliary processes." He pleads against a rupture of the zonula Zinnii, because the firm position and transparency of the lens were unchanged. To this I may object that I have seen a number of traumatic partial ruptures of the zonula, in some of which the lens was more or less tremulous, in all, however, its form was changed and astigmatism demonstrated by ophthalmoscopic and visual examinatious. The transparency of the lens was never interfered with, but what is of more importance for the explanation of our case—the anterior chamber was never shallow, nor the globe soft. In these cases probably as much bruising occurred as in those where the zonula remains entire. What then becomes of the aqueous humor in the cases where the anterior chamber is found empty?

Before answering this question, let me consider our case further. The angle of the iris—the sinus of the anterior chamber—was obliterated by the advancement of the lens, which crowded the iris against the posterior face of the cornea. A more favorable condition for the development of glaucoma, according to the theory of Knies-Weber could not be conceived. One might think that the patient was too young, its ocular capsule too elastic for the development of glaucomatous tension. Not at all; for two weeks after the injury a violent attack of glaucoma set in, and it set in so soon as the anterior chamber was restored and its sinus unobstructed, which fact is evidenced by the directly observed gradual restitution of the anterior chamber, accompanied by a corresponding diminution of the degree of myopia. When I examined the eye at the beginning of the glaucomatous symptoms, I found the depth of the anterior chamber fully restored, and in spite of the use of eserine the symptoms became more and more intense, until after 0,045 of morphia, leeches, and the continued use

of eserine, the pain was relieved and sleep obtained. This was the beginning of a permanent recovery. Whether the case of Schiess, in which recovery likewise ensued, went through a similar stage of increased eye-ball tension is not known, since the patient left him and returned six months later, after he had been cured for some months.

Now, those of my colleagues who have seen a greater number of eye patients will, no doubt, have recognized that the picture of our case corresponds in its course to that of a corneal fistula. Here, too, the anterior chamber is empty or shallow, and, so soon as by the closure of the fistula, the anterior chamber reacquires its normal depth, an acute glaucomatous attack sets in. In one such patient, whom, living near me, I had opportunities to watch, I witnessed about a dozen of acute glaucomatous attacks in the course of six years. They were always cut short by the piercing of the cystoid scar over the fistula. The last attack was unusually severe, showing suppuration in the corneal tissue adjacent to the fistula and very great turbidity of the vitreous, but led to a firm cicatricial closure of the fistula, restoration of the depth of the anterior chamber, normal eye-ball tension, and a recovery, which, up to this date—two years later—has proved undisturbed.

In analogy with these observations, and in considering the symptoms and the course of our case, I believe that the injury produced a perforation of the corneo-scleral wall, probably at the periphery of the anterior chamber, which had escaped my notice. How imperceptible such perforations may be, we know from many examples of slow closure of certain extraction and iridectomy wounds. As larger traumatic lacerations of the sclero-corneal junction are not infrequently met with, we may infer that they can occur also in any degree of smallness. While the majority of them probably heal rapidly, some of them may have a protracted closure, and in a few the closure may be followed by the immediate outbreak of a glaucomatous attack. This supposition seems satisfactorily to explain the different phenomena of the case, and lets it no longer appear surprising that glaucoma did not develop so long as the iris was

pressed against the cornea, but only when it had reassumed its natural position, for then the aqueous no longer oozed out, but was retained, and, if not secreted in greater quantity, the main avenues of its outlet, Fontana's spaces, may, during the pressure of the iris against them, have become more or less impervious.

I am loth further to tread on hypothetical ground, and, though the explanation I have given may not appear unsatisfactory, it is a supposition which a closer observation of the case might, perhaps, have converted into a fact. Will it not be possible that some one of our readers can soon supply the demonstration?

COLORING OF THE SHINING REFLEX AT THE EDGE OF LENSES DISLOCATED IN THE ANTERIOR CHAMBER; A NICE CLINICAL EXPERIMENT.

By H. KNAPP.

THE other day I demonstrated to the students of the New York Ophthalmic and Aural Institute a transparent lens which was dislocated into the anterior chamber. They all gazed with particular pleasure at the well-known shining, yellow reflex at the edge of the lens. Shortly before, I had shown them a case of partial dislocation of the lens in the posterior chamber, and explained to them that the dark curved line corresponding to the edge of the lens, resulted from total reflexion, the light coming from the background of the eye being at this place so deflected as not to reach our eye, on account of which this region, from which no light was received, appeared dark. "If the dark line," I asked them, "of a lens dislocated in the posterior chamber is the expression of total reflexion, why does the edge of a lens in the anterior chamber shine in a bright, and why, particularly, in a golden yellow light?" An answer not being immediately given, I added; "The shining line in this case is produced by light thrown obliquely into the lens and reflected at its edge. If this be correct, the reflected light must show the quality of the incident light, and, coming from a gas flame, appear yellow-red. Throw other light upon the eye and notice what reflex you obtain." They took the patient to a window, threw white light on his eye, and the reflex at the edge of the lens was bright white; then the patient was taken to the

ophthalmoscope room again, a green glass was held before the illuminating lens, and the reflex was shining green. The green glass had absorbed all the yellow and red rays of the gas flame and let only the green pass through. "This simple, yet beautiful experiment," I stated, "is probably not new, though it has not suggested itself to me before, nor am I aware of having seen it mentioned." [1]

[1] The lens in the patient alluded to had been dislocated by an injury six years ago. It had given rise to a good deal of irritation, and lately to glaucomatous symptoms. Sight was not extinct. The lens was extracted, with its capsule unbroken, through a superior flap section, without iridectomy, and without using traction instruments. A good deal of vitreous was lost, but the recovery was free from irritation, and the patient regained tolerably good vision.

REPORT ON THE MEETING OF THE OPHTHALMOLOGICAL SOCIETY AT HEIDELBERG, SEPTEMBER 14 AND 15, 1881.

By H. KNAPP.

Though not quite so well attended as in many former years, the last meeting of the Ophthalmological Society at Heidelberg offered so much instructive material that our readers, in expectation of the detailed transactions, may be supposed to accept a short report not without interest. The meeting was opened by Prof. v. ARLT, of Vienna, and Dr. E. MEYER, of Paris, was appointed chairman for the first day.

The first paper presented was by Dr. BRETTAUER, of Trieste, on the use of **iodoform in conjunctival affections.** Brettauer employed the remedy for the first time in a case of marginal phlyctenulæ, which at one place had developed into a small tumor. This tumor, having withstood all the usual means, was removed, but relapsed. Then Dr. Brettauer dusted iodoform powder on it with a camel's hair brush. The remedy was well borne; the tumor and small nodules around it soon disappeared. Since that time Brettauer employed iodoform with good results also for other affections, *e. g.*, for trachomatous pannus, acute granulations, and chronic interstitial keratitis.

The discussion showed that several gentlemen (HORNER, LEBER, CARL, NIEDEN, and HAASE) had employed iodoform as powder and salve (1 part to 15 parts of vaseline) for trachoma, chronic keratitis, and other diseases. CARL noticed that it occasionally produced irritation and small ulcers. NIEDEN recommended the addition of a small quantity of tannin to mask its disagreeable smell. All spoke favorably of the remedy.

Dr. HORSTMANN, of Berlin, on **recurrent iritis.** Analysis of 49

cases in 34 patients. In 38 eyes posterior synechiæ were left; the 11 eyes, which had been free from them, came early under treatment. Sure it was that the synechiæ exerted an unfavorable influence, for those cases relapsed more frequently; but relapses may be brought about also by other causes, such as syphilis, gonorrhœa, and perhaps scrofula. Salicylate of soda has proved useful. He is not convinced of the beneficial action of iridectomy.

V. ARLT ascribed only little importance to the synechiæ; after iridectomy he has not observed pure iritis to recur, but iridocyclitis to develop itself.

Prof. SATTLER, of Erlangen, made important and interesting communications on **trachoma** and **kindred conjunctival affections,** on which he had made investigations for several years. The spawn-like granules are the characteristic productions of this morbid process. Lymph follicles are not met with in a healthy conjunctiva. The trachoma granule contains nothing but small round or oval cells (nuclei), devoid of protaplasmic envelopes, and embedded in an exceedingly delicate, finely granulated substance, which, on addition of reagents, may be recognized as a fine reticulum not communicating with the nuclei. The trachoma granule is not converted into connective tissue; the connective tissue is furnished by the neighboring tissue which surrounds the granule as a capsule. The blood-vessels, in old trachoma, are often enormously thickened, and occasionally converted into cords. SATTLER has observed in the trachoma granule true divisions of lymphoid corpuscles. Iwanoff's glands are no new formations, but epithelial depressions.

In blennorrhœa neonatorum he could confirm the presence of Neisser's micrococcus by staining and cultivation. In trachoma he found the secretion and the superficial nuclei provided with a different kind of micrococcus, mostly grouped together by twos (diplococcus), not seldom also by threes and fours, but not in bacillar forms. In fresh specimens they were in active motion.

SATTLER has successfully grafted trachoma granules, and by experiments with cultivated micrococci he has obtained the same phenomena which are produced by nature. The lymphatics are injected and stuffed up. The *infectio per distans*, according to him, depends on contagious particles floating in the air.

HIRSCHBERG frequently has examined the discharge of blennorrhoic ophthalmia, and, as all others, has found in it the micrococci of Neisser. Also in diphtheria micrococci are present.

LEBER has found, in trachoma, micrococci in the secretion, the epithelium, and the superficial cells of the spawn-like granules, but a few only in their depth. Colonization appears to take place chiefly in the superficial layers. Attempts at inoculation of blennorrhoic and trachomatous secretions on rabbits failed.

HORNER likewise looks upon the glands of Iwanoff as depressions of the mucous membrane. In Switzerland, where indigenous trachoma is rare, he has frequently observed trachoma from the use of atropia and eserine. Miasmatic influences, to which he ascribes an important part, produce transitional forms; if contagion supervenes, true follicular trachoma develops.

BERLIN has observed true trachoma in an owl-family recently imported from the Carpathian mountains.

GOLDZIEHER considers the blennorrhoic mucous membrane of the genital organs as the breeding place of all ocular contagious substances. Example: A boy acquired gonorrhœa, infected a whole school in which subsequently all the various forms of conjunctivitis made their appearance.

Prof. KUHNT, of Jena, read an elaborate paper, illustrated by many excellent drawings, on the senile changes of the tissues of the eye. A short notice being insufficient for their understanding, we must wait for his detailed publication.

SAMELSOHN related a case of **embolism of one branch of the central retinal artery.** The defect in the visual field disappeared after some time. In the same way the vision was tolerably well restored in a case of total embolism of the central artery. S. explains this by the presence of a powerful cilio-retinal anastomosis which, in the first case, he also detected with the ophthalmoscope.

HIRSCHBERG communicated a case of **acute and transient one-sided neuro-retinitis and double-sided retinal hemorrhages after violent vomiting.** One optic nerve became atrophic, the other normal. Three years later the patient died after repeated hematemesis. Ulcer of the stomach. No blood in the intervaginal space of the optic nerve.

Prof. FUCHS, of Liege, made interesting statements concerning the **corneal opacity in increased eyeball tension.** The corneal opacity in glaucoma is directly dependent upon the increase of intraocular pressure. By eserine and operative treatment the cornea clears up in a few hours. Von Arlt supposed that it was caused by oedema of the cornea, and Fuchs was able

to confirm this microscopically in several globes that had been removed during increase of tension. He saw larger interfascicular spaces, the lamellæ loosened, and liquid accumulated also in the deeper epithelial layer of the cornea where it had been pressed from the cornea along the perforating nerves. The liquid may also coagulate. The well-known stippled appearance of the cornea does not result from detachment, but imbibition of the epithelium. In glaucoma the œdema is particularly pronounced in the superficial lamellæ of the cornea. The insensibility of the cornea is caused by compression and laceration of the corneal nerves.

In the afternoon session, which was held in the Ophthalmic Hospital at Heidelberg, microscopic specimens were demonstrated by SATTLER, HIRSCHBERG, FUCHS, SAMELSOHN and others, to illustrate their papers. BECKER showed his appliances for the determination of the light and color sense, which consisted in two square-shaped openings in the shutters of a dark room. These openings could be rendered larger and smaller according to the mechanism of the well-known light-sense meter of Förster. The perceptions of the patient are compared with those of a healthy observer, and are inversely proportionate to the width of the aperture. The method is very accurate.

A dentist exhibited tolerably beautiful **artificial eyes,** made of **celluloid.**

On the second day the chair was occupied by Prof. SATTLER.

Dr. BERLIN spoke of **injuries to the optic nerve by blunt force.** He related a case in which a fracture of the base of the skull had passed through the optic canal, torn the sheath of the optic nerve, and crushed the nerve itself. He states that already NUHN in his text-book of anatomy, in 1845, had referred the blindness following injuries of the forehead to a fracture of the walls of the optic foramen and subsequent lesion of the optic nerve.

Pertinent cases were related by MICHEL, E. MEYER, KRÜGER, and NIEDEN. MICHEL found in his case an atrophic appearance of the optic disc as early as two weeks after the injury ; in the other cases the atrophy was not recognizable until considerably later.

BECKER said that our knowledge of the nutrition of the posterior part of the optic nerve was insufficient.

KNAPP made some remarks on **quinine amaurosis,** basing his statements upon the recent American publications on this subject by ROOSA, VOORHIES, GRÜNING, MICHEL (St. Louis), and himself.

In addition to the severe, typical, cases described by these authors he drew attention to the milder ones which show the same characteristic symptoms, though with less intensity and of shorter duration, viz.: impairment of sight, diminution of the light and color sense, hardness of hearing, tinnitus aurium, ischæmia of the retina and optic nerve, and contraction of the visual field. He further stated that he had observed the same phenomena also after large doses of salicylic acid and salicylate of soda; a few correspoding cases had been published during the last years. He concluded by saying that these observations ought to give an incentive for experimental investigations, which promised to be fruitful in more than one respect.

BECKER said that such experiments had been made ten years ago. The blindness and ischæmia of the retina had been noticed, but the subject had not been followed up.

HORNER remarked that he had observed a similar case in a woman of forty-five years, affected with albuminuria and markedly atheromatous arteries.

Prof. MICHEL, of Würzburg, read a very elaborate and instructive paper on the **iris** and on **iritis,** which will appear in full in the forthcoming number of Graefe's Archives.

Some papers still on the bulletin could not be read for want of time.

In conclusion it may be mentioned that on a motion of Zehender, the example set by the London Medical Congress, viz., immediately to write down the remarks made in the discussion and to hand them to the secretary, was imitated by the Heidelberg Society and proved quite satisfactory.

SYSTEMATIC REPORT ON THE PROGRESS OF OPHTHALMOLOGY FOR THE FIRST HALF OF THE YEAR 1881.

By Drs. H. MAGNUS, of Breslau; C. HORSTMANN, of Berlin; and A. NIEDEN, of Bochum.

ASSISTED BY

Drs. E. Nettleship, of London; C. E. Fitzgerald, of Dublin; E. Marckwort and P. von Mittelsädt, of Antwerp; Dantone, of Rome; van der Laan, of Lisbon; Hirschmann, of Charkow; S. M. Burnett, of Washington.

A.—GENERAL OPHTHALMOLOGICAL LITERATURE; GENERAL PATHOLOGY, DIAGNOSIS, AND THERAPEUTICS; NORMAL ANATOMY AND PHYSIOLOGY.

By H. MAGNUS, M.D.

Translated by I. Furst, New York.

I.—TEXT-BOOKS, HISTORICAL AND STATISTICAL ARTICLES.

a.—TEXT-BOOKS AND GENERAL LITERATURE.

1. Albini e d'Angelo. Casuistica oftalmica in medicina legale. (Ophthalmic cases in legal medicine.) Morgagni, Jan., 1881.

2. Badal. Leçons d'ophthalmologie, mémoires d'optique physiologique Paris, vol. i.

3. Bert et Reynard. Les longueurs des ondes lumineuses et les actions chimiques. Soc. de Biol. *Gaz. Méd.*, No. 9.

4. Congresso periodico internazionale di Ottalmologia. 6 Sessione. 1 Congr. di Milano. *A. d'Ott.*, Bd. ix.

5. Cohn. Die Augen der Medizin-Studirenden. (The eyes of the medical students.) *Med. Jahrbücher.*

6. Cornu. Sur les conditions relatives à l'expression théorique de la vitesse de la lumière. *Compt. Rend.*, No. 2.

7. Exner. Vorlesungen über die Wellentheorie des Lichtes. (Lectures on the undulatory theory of light.) 1 Bd., erste Abthlg. Braunschweig, 1881.

8. GOLDZIEHER. Therapie der Augenkrankheiten für praktische Aerzte und Studirende. (**Therapeutics of Diseases of the Eye** for physicians and students.) Stuttgart, 1881. We note the omission of operative instructions, of the anomalies of refraction, accommodation, and motility. In the treatment of his subject, Goldzieher has laid the greatest stress upon the therapeutical indications, and considered the clinico-diagnostic part only incidentally. For this reason, as well as on account of the lack of the important chapters mentioned, the book will be of little use to the student; while it might form a serviceable adviser to the physician who is conversant with ophthalmology in its entirety. But even here we would prefer the complete text-books, the more so as the latter have recently been offered in excellent form.

9. JONES. Introductory lecture on the clinical study of the diseases of the eye. *Lancet*, vol. i, No. 1.

10. KLEIN. Lehrbuch der Augenheilkunde für praktische Aerzte und Studirende. (Text-book of ophthalmology for physicians and students.) Vienna and Leipzig, 1881, 780 pp., 45 wood-cuts. New edition.

11. MORTON. Refraction of the eye: its diagnosis and the correction of its errors, with a chapter on keratoscopy. London, 1881.

12. MICHEL. Jahresbericht über die Leistungen und Fortschritte im Gebiete der Ophthalmologie. (Annual report on the progress of ophthalmology.) Neunter Jahrg. Reports on the year 1878. Tübingen, 1881.

13. PHILIPSEN. Dioptrische Einleitung zum Studium der Refractionsanomalien des Auges. (Dioptric introduction to the study of the anomalies of refraction of the eye.) *Hosp. Pid.*, Bd. vii, p. 50.

14. REGNAULD. Une recette de Galien, à propos les mydriatiques. (A prescription of Galen concerning the mydriatics.) *Arch. Génér.*, March, 1881. Ladies with blue eyes, who would rather have them black, are advised to use hyoscyamus; according to Galen, the remedy produces this black coloration by the dilatation of the pupil.

15. VON REUSS. Die Blindheit und ihre Ursachen. (Blindness and its causes.) Sammlung gemeinnütziger Vorträge. Published by the Deutsche Verein zur Verbreitung gemeinnütziger Kenntnisse in Prague, No. 67.

16. SOUS. Traité d'optique considerée dans ses rapports avec l'examen de l'oeil. (A treatise on optics in reference to the examination of the eye.) Paris, 1881. Second édition.

17. TRÈVE. Quelques phenomènes d'optique. *Arch. Génér.*, 1881, Jan.

18. WOLFE. Lectures on ophthalmology. *Med. Times*, 1591.

b.—STATISTICAL PUBLICATIONS.

19. ALEXANDER. Second Report of the Ophthalmic Institute of the District of Aix-la-Chapelle. Aix-la-Chapelle, 1881. During 1880, there were 1,686 new patients; 16 extractions of senile cataracts, and 120 important operations.

20. DURR. Bericht über die ophthalmologische Thätigkeit in den Jahren 1877 bis 1880 und über 100 Staarextractionen nach A. von Gräfe's Methode. Hanover, 1881.

21. HAAS. Report of the Ophthalmic Hospital at Rotterdam for 1880. Patients, 2,658; operations, 155; extractions, 31.

22. JANY. Sixteenth Annual Report. Breslau, 1881. 3,716 patients; 57 extractions according to Gräfe.

23. KIPP. First Annual Report of the Newark Eye and Ear Infirmary. During 1880 there were 2,707 eye patients; 8 extractions according to Gräfe.

24. KNAPP. Eleventh Annual Report of the New York Ophthalmic and Aural Institute. 4,324 eye patients; 454 operations; 47 extractions.

25. Manhattan Eye and Ear Hospital. October, 1879–1880. 2,221 eye patients and 12 extractions.

26. MAIER. Seventh report of the Ophthalmic Department of the Vereinsklinik Karlsruhe, 1881. 4,552 patients; 100 extractions, 64 after Gräfe.

27. PAGENSTECHER. Annual report for 1880, with an historical review of the twenty-five years during which the Ophthalmic Hospital of Wiesbaden has been in existence. 1,606 dispensary, 602 hospital patients; 71 extractions.

28. PASSIATORE. Report on 309 ophthalmic operations performed by Profs. Magni and Gatti. *Riv. clin.*, 2 S., Bd. x.

29. Presbyterian Eye and Ear Hospital at Baltimore. 1881. 2,101 new patients, 446 operations, 64 extractions after Gräfe.

30. ROSMINI. Clinical report of the Ophthalmic Institute at Milan, for the quinquennium 1874–1878. *Gaz. med. ital.*, Lombardi, Nos. 8, 9.

31. SAMELSOHN. Sixth annual report of the Cologne Ophthalmic Institute. 2,257 patients.

32. SCHÖLER. Annual report on the Ophthalmic Clinic of Prof. Schöler during 1880. Berlin, 1881. 4,124 patients, 351 operations. Scientific contributions on several subjects.

33. WICHERKIEWICZ. Third annual report of the Ophthalmic Institute for the Poor, at Posen. 2,315 patients, 70 iridectomies, 44 extractions.

II.—GENERAL PATHOLOGY, DIAGNOSIS, AND THERAPEUTICS.

34. BERGER. Ueber das Verhalten der Sinnesorgane im hypnotischen Zustand. (The organs of special sense in the hypnotic condition.) Phys. Verein zu Breslau. Session of Feb. 7, 1881. *Breslauer ärztl. Zeitschr.*, 1881, No. 7. The sense of light is sharpened to such a degree that medium-sized print can be read without effort in a room with minimal illumination, in which a normal eye was unable to perceive any kind of type.

35. BRONNER and APPLEYARD. A case of foreign body in the eyeball, removed by the use of an **electro-magnet.** *Brit. Med. Journ.*, April 16th. The extraction with the magnet failed at first, but succeeded after a preceding iridectomy. FITZGERALD.

36. C. S. BULL. The removal of foreign bodies from the interior of the eye. These ARCHIVES and *A. f. A.* Four cases with good results.

37. CHIBRET. De la suppression des collyres liquides. (On the suppression of liquid collyria.) *A. d'Ophth.*, i. Recommends to substitute vaseline ointments for all collyria.

38. COSTA-PRUNEDA. Ueber primäre menschliche Iristuberculose mit erfolgreicher Ueberimpfung auf das Kaninchen. (On primary tuberculosis of the iris in man, with successful inoculation on the rabbit.) *Inaug.-Dissert.*, Berlin, 1881.

40. DICKINSON. Mechanism of hemiopia, based on the theory of the total decussation of the fibres of the optic tracts at the chiasma. *St. Louis Med. and Surg. Journ.*, vol. xl, No. 1.

41. FALCHI. On the effects of the injection of pus into the eye, especially upon the retina and choroid. *Atti della R. Acad. delle Scienze*, vol. xvi. The retina is most commonly affected, the choroid less frequently; retinitis and choroiditis purulenta ensue; the papilla undergoes similar changes.

42. FORT. Les derniers perfectionnements de l'opération de la cataracte. (The last improvements in cataract operation.) *Gaz. des Hôp.*, 1881, Nos. 4 and 5. Recommends the best possible cleansing of the wound of cortical remnants and blood coagula.

43. FRÖHLICH. Anwendung des Electro-magneten mit nachfolgender Amputatio Bulbi. (Application of the electro-magnet, with subsequent amputation of the globe.) *Z. M.*, 1881, p. 28.

45. GALEZOWSKI. Moyens de conjurer les dangers de l'ophthalmie des nouveau-nés. (Means to avert the dangers of ophthalmia neonatorum.) *Annal. d'Hyg. publiq.*, No. 28. Strict official medical supervision; locally, silver nitrate.

46. GALEZOWSKI. De la **synéchotomie dans le leucome adhérent**. *R. d'Ophth.*, No. 3. Recommends the division of anterior synechiæ in order to improve the optical conditions, and to prevent staphyloma and secondary glaucoma. Operates with a knife especially constructed by himself; six times with favorable results up to date.

47. HAAB. Kleinere ophthalmologische Mittheilungen. (Minor ophthalmological communications.) 1. Antisepsis and operative progress. 2. Parasitical eye affections. *Correspondenzbl. f. schweiz. Aerzte*, 1881, Nos. 2–4. Resorcin (3–5 per cent.) is recommended as the best antiseptic; it injures the cornea very slightly.

48. HARDY. On foreign bodies within the eye, and the **electro-magnet** as an aid to their removal and detection; with cases. *Brit. Med. Journ.*, March 26th. The location of a piece of iron in the eye could as yet not be ascertained with the aid of the magnetic needle. FITZGERALD.

49. JUST. Zur Frage der Antisepsis by Augenoperationen. (On the **question of antisepsis in eye operations**.) *C. f. A.* Without antisepsis, in 200 extractions no corneal suppuration ensued; with antisepsis (washing with carbolic solution before operation, disinfection of the instruments with alcohol, dressing with borated lint, protective and dressing cotton), in 207 extractions, nine cases of corneal suppuration.

50. KNIES. Extraction eines nicht sichtbaren Fremdkörpers aus dem Auge mit Hülfe des **Electromagneten**. (Extraction of an invisible foreign body from the eye by the aid of an electro-magnet.) *Z. M.*, 1881, p. 30.

51. KROLL. Zur Ætiologie der angeborenen Missbildungen des mensch-

lichen Auges. (On the etiology of congenital malformations of the human eye.) *C. f. A.* Infection of the eye by fetid amniotic fluid.

52. LITTEN. Ueber einige vom allgemein-klinischen Standpunkte aus interessante Augenveränderungen. (On some clinically interesting alterations of the eye.) *Berliner Klin. Wochenschr.*, No. 1. In **general anæmia two kinds of ocular alterations occur:** in the first, anæmia of the retina, consisting in light coloration of the fundus, pallor of the papilla, narrowing and pallor of the vessels, indistinctness of the reflex streak. The other kind exhibits hemorrhages of the retina, white patches on the retina, at times also inflammatory processes of the retina and the optic nerve. The white patches mostly consist of nothing but white blood corpuscles; occasionally, however, of hypertrophied nerve fibres also. In general venous stasis, the fundus is dark, the papilla strongly hyperæmic; the retinal vessels, even to their finest anastomoses, are greatly injected, dilated, and tortuous. Hemorrhages also occur as well as white patches; the latter, however, are rare.

53. MARCKWORT. Experimentelle Studien über Läsionendes Nervus opticus. (Experimental studies of **lesions of the optic nerve.**) *A. f. A.*, 1881, 3. The experiments consisted of compression, ligation, and division (with or without central vessels) of the optic nerve. 1. Compression after preceding division of the vasa vortic. and of the art. cil. longæ causes sudden circumscribed cloudiness of the retina, resulting from œdema of the retinal vascular layer. On remitting the pressure, retinal hemorrhages, particularly at the curves of the vessels. 2. Ligation, including the art. cil. breves, causes atrophy of the optic nerve and the retina. 3. Division of the optic nerve without the vessels, 7 *mm.* behind the globe, produces atrophy of the nerve with degeneration of the layer of nerve fibres into connective tissue. Division close to the optic foramen produces no material alterations.

The cloudiness of the retina occurring after lesions of the optic nerve is a consequence of the injury to the vessels; trauma of the nerve between the retina and the place of entry of the vessels into the nerve is followed by atrophy of the optic nerve and the retina.

54. NIEDEN. Ueber die Prothesis oculi bei Kindern. (On the prothesis oculi in children) *C. f. A.* Inasmuch as glass eyes may become dangerous in children, he advises the use of the less brittle eyes made of vulcanite (caoutchouc, sulphur, and oxide of zinc).

55. OWENS. Removal of a fragment of iron from the vitreous chamber by means of the **electro-magnet.** *Brit. Med. Journ.*, June 25th. A fragment of steel floating in the vitreous was successfully extracted with the magnet, after preceding incision of the globe. S finally = $\frac{20}{20}$. FITZGERALD.

56. PAGENSTECHER. Two cases of extraction of iron chips from the vitreous, with remarks on the diagnosis and extraction of pieces of steel and iron by means of the **magnet.** *A. f. A.*; these ARCHIVES, No. 3.

57. PANAS. Examen des **conditions qui peuvent influencer les résultats operatoires** en ophthalmologie. Leçon d'ouverture recueillie par le Dr. Bellouard. *Progrès Méd.*, Nos. 1 and 2. General conditions: 1. Age; operative results are better in younger individuals than in the older; in the latter, suppuration occurs more easily. 2. Season; of subordinate influence; 3. Cli-

mate; of great influence; cold and humidity are injurious to operations for cataract. 4. Puerperium; operations to be performed two months after delivery. Individual conditions: cachexia, alcoholism, diabetes, albuminuria impair the operative results; gout and rheumatism predispose to iritis after cataract operations; syphilis, tuberculosis, affections of the heart, spleen, and liver have an injurious influence. Local conditions: granulations and purulent catarrhal processes must be cured previous to any operation.

58. POOLEY. On the discovery of foreign bodies of steel and iron in the eye by means of a magnetic needle. These ARCHIVES and *A. f. A.* The foreign bodies are to be rendered magnetic within the eye; the position of the magnetic needle will then indicate their location.

59. PROUT. Removal of a piece of iron from the vitreous, with preservation of the globe and of perception of light. These ARCHIVES and *A. f. A.* Without a magnet.

60. PONCET. De la **section** vasculo-nerveuse **optico-ciliare** et des **altérations consécutives dans les membranes profondes** de l'œil. *Arch. d'Ophth.*, 1881, Jan., Febr. The circulatory disturbance causes an emigration of white blood-corpuscles into the limitans interna retinæ. Later, there occurs an inflammation of the severed ends of the vessels, which extends into the eye. Finally, sclerosis of the retina succeeds, with immigration and deposition of pigment in the retina and the vitreous; and, lastly, phthisis of the globe. Besides these chronic alterations, we find the occurrence of acute inflammatory sequelæ at the posterior pole of the eye, which depend upon the lesions of the arteries there situated. In order to avoid the latter, Poncet advises to divide the nerve 6 *mm.* behind the globe.

61. RHEINDORF. Extraction eines Fremdkörpers aus dem Auge mit Hülfe eines **Magneten**. (Extraction of a foreign body from the eye by the aid of a magnet.) *Z. M.*, p, 244.

63. RIJNBECK. Over het endemisch Ooglijden der minervermogende Bevolking te Amsterdam. (On the endemic eye affection of the indigent population of Amsterdam.) Amsterdam, 1881.

64. SALTINI has attempted the inoculation of chalazion with negative results. *A. d'Ottal.*, vol. i, 1881.

65. SCHAFFER. Beitrag zur Behandlung der ansteckenden Augenentzündungen. (Contribution to the treatment of the contagious inflammations of the eye.) *Wiener Med. Presse*, Bd. xxii, Nos. 24 and 25. Repudiates local treatment, advises the internal use of potassium iodide.

66. SNELL. On the employment of the **magnet** and electro-magnet in the removal of iron and steel fragments from the interior of the eye. *Brit. Med. Jour.*, May 16th. Reports three successful cases and describes a magnet devised by himself. FITZGERALD.

67. THEOBALD. Eine neue Augenbandage. (A new eye bandage.) These ARCHIVES, and *A. f. A.*

68. VIDOR. Die Antiseptik in der Augenheilkunde. **(Antisepsis in ophthalmology.)** *Wiener Med. Wochenschr.*, Nos. 1 and 2.

69. WECKER. Ueber Nervendehnung und ihre Anwendung in der Oph-

thalmo-Chirurgie. (On **nerve-stretching** and its application to ophthalmic surgery.) Lecture read, February 22, 1881, before the medical faculty at Madrid. *Z. M.; A. d'O.*, March, April. After division of the internal rectus and loosening of Tenon's capsule, the optic nerve is seized with a bent hook and drawn forward as much as possible. The therapeutic effects of this procedure remain to be seen.

70. WECKER. Des **manifestations oculaires diathésiques,** scrofulose, tuberculose, rheumatisme, syphilis. *A. d'O.*, Jan., Feb. In scrofulosis, the common integument of the body possesses too little power of resistance, and is therefore inclined to the formation of quickly decomposing inflammatory products. The most important indications are to remove these products and to nourish the skin. In rheumatic affections, injections of pilocarpine and sodium salicylate are employed.

III.—INSTRUMENTS AND REMEDIAL AGENTS.

71. BEAUVAIS. De l'empoissonnement accidentel par le sulfate neutre d'atropine employé en collyre. *Ann. d'Hyg.*, 1881, Jan.

72. DAHNBERG. Bedeutung des Eserins in der Augenheilkunde. (The importance of **eserine** in ophthalmology.) Allgem. Verein St. Petersburger Aerzte, Oct. 28, 1880. *Petersburger Med. Wochenschrift*, 1881, No. 4. Eserine is a palliative in glaucoma; it is likely to remove prodromal conditions and slight cases of glaucoma, and to greatly ameliorate grave cases, at least temporarily. But it does not permanently cure a glaucoma. The principal advantage in the therapeutical application of eserine in glaucoma, however, consists in this, that it prepares the glaucomatous eye for the operation, and facilitates the technique of the latter. Eserine is also very effective in corneal abscesses with hypopyon, and in prolapse of the iris. After every iridectomy, eserine is indicated to prevent the healing into the wound of a segment of the iris; also in the extraction of foreign bodies from the anterior chamber. Eserine, moreover, limits the secretion, and its use is therefore to be recommended in blennorrhoic conjunctivitis. Posterior synechiæ were rarely (?) observed after the employment of eserine.

73. EDLEFSEN and ILLING. Ueber Hyoscinum hydrochloricum and hydrojodicum. *C. f. d. Med. Wissench.*, 1881, No. 23. The latter is a very energetic mydriatic; but care must be exercised in its use, on account of its rapid and intense general effect.

74. v. FORSTER. Hydrochinon als Antisepticum in der augenärztlichen Praxis. (Hydroquinone as an antiseptic in ophthalmic practice.) *Aerztliches Intelligenzbl.*, No. 22.

75. FRÖHLICH. Ein Electro-magnet. *Z. M.*

76. GALEZOWSKI. Homatropine. Soc. de Biol., Feb. 12, 1881. *Progr. Méd.*, No. 8.

77. GALEZOWSKI. De l'homatropine et de son action sur l'œil. *Journ. de Thérap.*, No. 4. *R. d'Ophth.*, No. 5. Has a strong mydriatic effect for about 18 to 20 hours; paralyzes the accommodation but little; does not irritate the eye.

78. GALEZOWSKI. **L'huile de cade est un excellent antiseptique** dans les affections oculaires. *R. d'Ophth.*, No. 5. Is opposed to antiseptics such as carbolic and boracic acids, etc., but is impressed with the effect of oil of cade ; he employs it in form of ointments, namely, 0.5—2.0, in vaseline 10.0.

79. GLAN. See color-perception.

80. GRÜNING. Demonstration of a magnet for the removal of pieces of iron and steel from the vitreous. Trans. Amer. Med. Ass. These ARCHIVES ; *A. f. A.; Med. Rec.*

81. HOTZ. The value of **homatropine** in ophthalmic practice. *Chicago Med Journ.*, 1881, Feb.

82. KROSTA. On hydrobromate of homatropine. Gesellsch. d. Charité-Aerzte, Dec. 23, 1880. *Berliner Klin. Wochenschr.*, No. 6.

83. LOISEAU. La question des **optomètres.** L' optométrie subjective, l'optométrie mixte, et l'optométrie objective. Nouvel ophthalmoscope. *A. a'O.*, 1881, Jan., Feb.

84. MAUREL. Filière métrique pour le cathéterisme des voies lacrymales. *Bull. Génér. de Thérap.*, Feb. 15th.

85. PARENT. Ophthalmoscope à réfraction métrique. *A. a'O.*, 1881, Jan.

86. PARINAUD. Aiguille-pince. (Needle-forceps.) *A. a'O.*, 1881, Jan., Feb. Intended for the division and extraction of the capsule in secondary cataract.

87. PLACIDO. Novo instrumento para analyse immediate das irregularidades de curvatura da cornea. Astigmatoscopio explorador. Novo apparato para applicar o calor humido nos doenças oculares. (A new instrument for the immediate analysis of irregularities in the curvature of the cornea. Explorative astigmoscope. A new apparatus for the application of moist heat to the eye.) *Period. d. Oftal. Prat.*, vol. ii, Nos. 5 and 6.

88. REGNAULT et VALMONT. Étude pharmacologique sur les alcaloides des mydriatiques. *Arch. Génér.*, 1881, Jan.

89. RISLEY. The value of **homatropine** hydrobromate in ophthalmic practice. *The Amer. Journ. of the Med. Sc.*, No. 161.

90. ROTHE. See color-perception.

91. SCHÄFER. Comparative investigations of the effects upon the eye of atropine, duboisine, and homatropine. *A. f. A.;* these ARCHIVES, x, p. 196. Atropine has a slow but lasting dilating effect upon the pupil. Duboisine dilates the pupil rapidly and energetically, but its effects are evanescent. Homatropine acts in the shortest time, but secures only a limited dilatation of the pupil and very quickly declines in its effect. The accommodation becomes paralyzed most speedily by duboisine and homatropine ; by duboisine more rapidly than by homatropine. With homatropine the effect is over in 24 hours ; with duboisine, however, not until after three or four days.

92. SCHIRMER. Homatropin. Lex.-Art. Real-Encyclopädie, Bd. vi.

93. VON SCHRÖDER. Ueber die Behandlung von Augenleiden mittelst Pilocarpin. (On the treatment of eye effections by means of pilocarpine.) Vortrag im allg. Verein Petersburger Aerzte, Nov. 25, 1880. *Petersburger Med.*

Wochenschr., 1881, No. 5. Commences generally with 0.015 gramme of pilocarpine subcutaneously; larger doses than 0.03 he thinks are unnecessary. In the treatment of albuminuric retinitis it is a very valuable, symptomatic remedy. The indications are not yet clearly defined.

94. SEELY. Homatropine hydrobromate. *Cincinnati Lancet*, vol. v, No. 21.

95. SEELY. Prevention of the irritating effects of atropia. *Cinc. Lancet*, vol. vi, No. 13.

96. SEELY. The yellow oxide. *Cinc. Lancet*, vol. vi, No. 13.

IV.—ANATOMY.

97. ANGELUCCI. On the **development** and **structure** of the **anterior uveal tract** of the vertebrates. *Arch. f. micr. Anat.*, Bd. xix.

98. AYRES. The development of the eye. *New York Med. Journ.*, 1881, July.

99. BAUMGARTEN. On the semi-decussation of the fibres of the optic nerve. *A. f. O.*, Bd. xxvii, 1. Polemics against Michel.

100. BECKER. The vessels of the human macula lutea, figured from an injected specimen by Heinrich Müller. *A. f. O.*, Bd. xxvii, 1.

101. BERGER. Contributions to the anatomy of the eye of fishes. *Zoolog. Anz.*, 1881, No. 83.

102. COHN. On the anatomy of the persisting pupillary membrane. *C. f. A.*

103. DENISSENKO. On the structure and function of the crista in the eye of birds. *Arch. f. Micr. Anat.*, Bd. xxi. In the crista, a colorless fluid (lymph) is prepared which is absorbed into the retina as a nutrient fluid; the crista, in the main, is to be looked upon as a nutritive organ for the retina.

104. DENISSENKO. On the structure of the external granular layer of the retina in the vertebrates. *Arch. f. Micr. Anat.*, Bd. xxi, H. 3.

105. ÉLOUI. Recherches histologiques sur le tissu connectif de la cornée des animaux vertébrés. Paris, 1881.

106. FANO. Sur les fonctions du muscle oblique de l'œil chez l'homme. *Gaz. Méd.*, No. 3.

107. FÜRST. On the nerves of the iris. *Nord. med. Arch.*, Bd. xii, 3, No. 19.

108. GARDINER. A case of persistence of the hyaloid canal and the hyaloid artery. These ARCHIVES, ix, p. 473; *A. f. A.*

109. GEGENBAUER. Ueber die Pars facialis des Os lacrymale des Menschen. (On the facial part of the lachrymal bone in man.) *Morpholog. Jahrbuch*, Bd. vii, H. 1. The hamulus developing from the crista of the lachrymal bone may at times become large enough to reach the edge of the infra-orbital margin and to merge with its external end into the continuation of the latter: this is the so-called facial part of the lachrymal bone. Such formation must be considered to be atavistic.

110. HOCQUART. Étude sur un cas de cryptophalmos bilatéral. *A. d'Oph.*, Bd. 1. Lids and eyes seemed to be completely absent. On examination, two

small, but regularly formed globes were found. The cause is to be sought in a disturbance of development in the stage where the ectoderm inserts itself into the primary ocular vesicle to form the lens, and the cephalic plates extend from the side. In favor of this assumption is the arrangement of the layers of tissue forming the anterior segment of the globe; the posterior segment of the eye was of relatively normal development.

112. KRAUSE. Ueber die Doppelnatur des Ganglion ciliare. *Morph. Jahrb.*, Bd. vii, 1. In the rabbit, the ciliary ganglion is of the same nature as in man. Compare the statements of Schwalbe in previous reports.

113. KRAUSE. Ueber die Retinazapfen der nächtlichen Thiere. (On the retinal cones of nocturnal animals.) *Arch. f. micr. Anat.*, 1831.

114. KLEIN. Glaskörper. (Vitreous.) Lex.-Artikel. *Real-Encyclopädie der ges. Heilk.*, Bd. vi.

115. LANDOLT. **Relation between the conformation of the cranium and that of the eye.** *Brit. Med. Journ.*, April 2d. Asymmetry of the cranium is usually accompanied by anisometropy and astigmatism. The side of the forehead corresponding to the eye with the stronger refraction is more fully developed. The other half of the forehead corresponding to the eye with the lesser refraction is flatter, more receding, and smaller. The forehead is of paramount importance in the development of the eyes. FITZGERALD.

116. MARCHI. Sugli organi terminali nervosi nei tendini dei muscoli motori dell' occhio. (On the terminal nervous organs in the tendons of the ocular muscles.) Turin, 1881. Large, spindle-shaped, forked plaques are arranged longitudinally in the tendon. The nerve-fibre enters at the side or the middle of these plaques, and then separates into several medullary branches which again subdivide.

117. OTTO. The nictitating membrane in man. *New Orleans Med. and Surg. Journ.*, vol. viii, No. 6. In negroes, cartilaginous tissue has been observed in the semilunar fold.

118. TARENT. De la région de la macula. *Rec. d'Ophth.*, 1881, No. 3. Not the entire macula, but only the fovea centralis is free from vessels.

119. VON REUSS. Investigations into **the effect of age upon the curvature of the cornea,** with some remarks on the dimensions of the palpebral fissure. *A. f. O.*, Bd. xxvii. 1. In children, in the first weeks of life, the corneal curvature is much greater, the radius therefore much shorter than in the normal eye of the adult. Its greatest alteration certainly occurs in the first six months of life. From that period on, the corneal radius increases gradually until the seventh year. From the seventh until the completed twelfth year the cornea appears to suffer no change in its curvature. In the thirteenth and fourteenth years a decided growth of the corneal radius may again be demonstrated. Between the fifteenth and twentieth years it reaches the size which we find in adults under normal conditions.

120. SCZELKOW. On the alteration of the corneal curvature in advancing age. *Med. Central-Bl.*, Bd. xviii, 44.

121. VIRCHOW. On the vessels in the eye and its vicinity in the frog. *Zeitsch. f. wissensch. Zool.*, Bd. xxvi, H. 2.

V.—PHYSIOLOGY.

a.—CORNEA, IRIS, AND REFRACTIVE MEDIA.

122. CROULLEBOIS. Sur la grandeur et les variations des images de Purkenje. *Compt. Rend.*, Paris, 1881, Jan. 10.

123. GÉRALD et LABORDE. Recherches sur le mode d'action physiologique des principales substances medicamenteuses, qui agissent sur la pupille. *Rev. d'Oculˆ. du Sud-ouest*, No. 5.

124. LEESER. Die Pupillarbewegung in physiologischer und pathologischer Beziehung. Mit einem Vorwort von Prof. Dr. Alfred Gräfe. (The **motion of the pupil in its physiological and pathological bearing.** With a preface by Prof. Alfred Gräfe.) Wiesbaden, 1881, 124 pp. and one lithographic plate. A prize was awarded to this essay by the medical faculty of the university of Halle-Wittenberg. Is distinguished by a very clever and exhaustive compilation of the literature of the subject; both the physiological and pathological phenomena of the pupil are represented under the most painstaking reference to literature. The practical value of the little essay is lessened to some degree by the total absence of a table of contents, and by the lack of any subdivision of the matter which otherwise is instructively handled.

125. LEROY. Optique physiologique. Théorie de l'astigmatisme. Travaux de laboratoire de clinique ophth. de la faculté de méd. de Lyon. *A. d'Ophth.*, Bd. i.

126. KNAPP. Lichtbrechung durch asymmetrische Flächen. (Refraction of light by asymmetrical surfaces.) Trans. Amer. Med. Association, 1880. These ARCHIVES, ix, p. 346; *A. f. A.*

127. MATTHIESEN. New investigations of the aplanatism and the periscopy of the crystalline lens of the eye of fishes. *Arch. f. d. ges. Phys.*, Bd. xxv, H. 5 and 6.

128. MATTHIESEN. Zur Integration der Differentialgleichungen der Dioptrik der continuirlich geschichteten, kugelförmigen Krystalllinse der Fische. (On the integration of the differential equations in the dioptrics of the spherical crystalline lens of fishes, which is built up by continuous layers.) *Zeitschr. f. Math. und Physik.*, Bd. xxvi, 3.

129. SCHÖLER. Experimentelle Bestimmung der Widerstandskraft der Zonula Zinnii, Hyaloidea, wie der Linsenkapsel. (Experimental determination of the power of resistance of the zonula Zinnii, the hyaloid membrane, and the lens capsule.) Annual report of the Ophthalmic Institute of Prof. Schöler for the year 1880. Berlin, 1881. The mean power of resistance possessed by the zonula in the human eye amounts to about 47 *mm.* Hg.

130. SCHÖN. Brechung schiefer Strahlenbündel in thierischen Linsen. (The **refraction of oblique pencils of light** in animal lenses.) *C. f. A.*

131. TUWIM. Ueber die physiologische Beziehung des Ganglion cervicale supremum zu der Iris und den Kopfarterien. (**On the physiological relation of the supreme cervical ganglion to the iris and the arteries of the head.** *Arch. f. d. ges. Phys.*, Bd. xxiv, H. 3 and 4. In warm-blooded animals, the supreme cervical ganglion exerts a nutritive effect upon the nerves of the iris

arising from it, even after complete division of all its cerebro-spinal communicating branches. An independent, tonic influence upon the fibres of the iris dilating the pupil cannot be denied to the supreme cervical ganglion. The branch connecting the supreme cervical ganglion with the hypoglossal nerve does not transmit to that ganglion any pupil-dilating nerve-fibres, even in warm-blooded animals.

132. VALENTIN. Unterscheidung zweier Arten optischer Achsen in den verschiedenen doppeltbrechenden, organischen Gebilden. (Differentiation between two kinds of optical axes in the various doubly refractive, organic formations.) *Arch. f. d. ges. Phys.*, Bd. xxiv, H. 7 and 8.

b.—RETINA, OPTIC NERVE, CENTRAL ORGAN.

133. BADAL. Études d'optique physiologique. (Studies in physiological optics.) *Annales d' O.*, Bd. lxxxiv.

134. BADAL. Micropsie, macropsie et metamorphopsie rétiniennes. *Rev. Hebd. d. Sc. Méd. de Bordeaux*, 1881. Distinguishes four forms of micropsia: muscular, accommodative, retinal, cerebral; macropsia is very rare.

135. BARTHÉLEMY. Instructions raisonnées pour l'examen de la vision devant les conseils de revision et de reforme dans la marine et l'armée. Paris, 1881. Was discussed more in detail by Poncet in *Le Progr. Méd.*, 1881, No. 6.

136. CHARPENTIER. Remarques sur la sensibilité differentielle de l'œil. *A. d'Ophth. Franç.*, 1881, Jan., Feb. The sensibility to light is the simplest reaction, next comes the sensibility to colors, and last the sense of form. The differential sensibility for successive impressions of light amounts to 0.07—0.08. This quantity is the same for the periphery and the centre of the retina.

137. CHARPENTIER. Illumination violette de la rétine sous l'influence d'oscillation lumineuse. *Compt. Rend.*, No. 7.

138. CHARPENTIER. Sur les variations de la sensibilité lumineuse suivant l'étendue des parties rétiniennes excitées. *Gaz. Méd.*, No. 2; *Rev. d'Ocul. du Sud-ouest*, No. 5.

139. CRITCHETT. **Chart for measuring the field of vision.** *Brit. Med. Journ.*, 1881, Jan. 1. A chart of 60 square *cm.* is divided into small quadrangles of 5 *cm.* each, a part of which is colored pale-gray. Every eye must be tested at a distance of 30 *cm.* from the chart. A black central point of 1 *mm.* is to be fixed; around this point delicate circles run, at a distance apart of two and a half degrees. A small metal pencil, the point of which equals exactly the central spot on the chart in size and color, is employed by the examiner. FITZGERALD.

140. DALTON. Centres of vision in the cerebral hemispheres. *Med. Record*, Bd. xix, 13.

141. HELFREICH. On the venous pulse of the retina. Preliminary communication. Würzburg, 1881.

142. JAVAL. De la vision binoculaire. *A. d'Oc.*, 1881, May to June.

143. MUNK. Ueber die Functionen der Grosshirnrinde. (On **the functions of the cerebral cortex.**) Berlin, 1881, pp. 133, 1 plate. In the dog,

the greater part of the cortex of the occipital lobe corresponds to a visual centre; there the fibres of the optic nerve are received in the following manner: The greater part of the retina of the left eye is connected with the right visual centre; only the extreme lateral part, never amounting to more than a quarter of the entire retina, belongs to the visual centre of the same side. The same holds good for the radiation of the optic nerve of the right eye. The irradiation of the fibres is so arranged that the distribution of the retinal terminations is to the distribution of the cortical terminations in the crossed hemisphere in the same relation as object and mirror image; thus, what was right appears left; what was above appears again above, respectively in front at the convexity of the cortex. Extirpation of isolated parts of the visual centre produces blindness of the corresponding parts of the retina; total extirpation of the visual centre of one side renders the eye of the opposite side blind, excepting the portions above mentioned. Extirpation of both visual centres causes complete permanent blindness. Each visual centre contains a portion, the extirpation of which effects the loss of the memory of images in the opposite eye; a dog thus mutilated perceives an object, but does not recognize it. However, this loss of the memory of images can be compensated for, other portions of the visual centre assuming the functions of the extirpated part. This species of blindness is denominated mental blindness (soul-blindness), in contradistinction to the other species which is called cortical blindness. The portion of the visual centre the extirpation of which effects mental blindness contains also the central terminations of those parts of the retina which are included in the fovea centralis.

144. REID. On the direct measurement of ophthalmoscopic objects. *Brit. Med. Journ.*, 1881, p. 10.

145. TREVE. Quelques phénomènes d'optique et de vision. *Arch. Génér.*, Jan.; *Compt. Rend.*, No. 10.

146. ULRICH. Das ophthalmoscopische Gesichtsfeld. (The ophthalmoscopic field of vision.) *Z. M.*

147. WARLOMONT. On the use of optometers for the examination of soldiers and workmen employed on railroads. *Brit. Med. Journ.*, 1881, March 5. The use of spectacles in the army is permitted under the following conditious: S in the right eye must not be less than $\frac{1}{3}$; the myopia must not be greater than $\frac{1}{4}$, and the hypermetropia not greater than $\frac{1}{4}$. In simulated myopia atropine is employed, as also in hypermetropia, in order to determine its full degree. Persons opposed to the use of mydriatics, and who assert not to be able to see through glasses, are sent to the ophthalmic military commission, which is presided over by Loiseau at Louvain, where they are tested with the ophthalmoscoptometer by Warlomont and Loiseau. FITZGERALD.

c.—COLOR-PERCEPTION.

148. BADAL. Échiquier pour l'examen de la vision des couleurs. *Rev. d'Ocul. du Sud-ouest*, Jan. A plate is provided with 21 holes, 20 of which are each filled by a colored movable cylinder. The color of these cylinders is besides fastened to the plate above each opening; of course, the color above each opening and that of the cylinder filling it are always identical. The ex-

aminer now points to one, then to another color, and has their names stated to him. Then all the cylinders are taken out, and the person examined must replace them according to the colors above the openings.

149. BANNISTER. On some points in regard to color-blindness. *Journ. of Nervous and Ment. Dis.*, No. 6.

150. BOLL. Theses and hypotheses on the perception of light and colors. *Arch. f. Anat. u. Phys., Phys. Abth.*, 1881, H. 1 and 2. An unfinished attempt to demonstrate that the three percipient layers of the retina which Boll has distinguished, are the organs which perceive the three elementary colors.

151. OLE BULL. Studien über Licht und Farbensinn. (Studies of the sense of light and color.) *A. f. O.*, Bd. xxvii, 1. 1. The sense of light. 2. The sense of light in the periphery of the retina. 3. The sense of color. 4. Sensibility to colors in the peripheral parts of the retina. The senses of light and color decline uniformly with decreasing illumination; the limit of visibility for the smallest visual angle is inversely proportional to the square of the intensity of light.

152. S. M. BURNETT. Color-perception and color-blindness. These ARCHIVES, vol. x, No. 1, March 1881. Rejects the theory of Hering and of Young-Helmholtz, and endeavors to make it appear probable that perception of light and color is but a higher modification of the sense of temperature.

153. H. COHN. Ueber die schnellste, einfachste und zuverlässigste Methode zur Entdeckung der Farbenblindheit. (On the quickest, simplest, and most reliable method for the detection of color-blindness.) *Berl. Klin. Wochenschrift*, No. 19. Repudiates his former favorable opinion of Holmgren's method, and declares the latter to be at present quite insufficient for the more delicate tests and even little suited for general examinations: the best method is stated to be the employment of plate 2 of Stilling's late edition of his pseudo-isochromatic plates.

154. CHARPENTIER. Sur la sensibilité visuelle et ses rapports avec la sensibilité lumineuse et la sensibilité chromatique. *Gaz. Méd.*, No. 2.

155. CHARPENTIER. Sur la quantité de lumière pour percevoir la couleur d'objets de différents surfaces. *Compt. Rend.*, No. 2.

156. Il Daltonismo e la sicurezza dei viaggiatori di terra e di mare. (Daltonism and the security of travellers by land and by sea.) *Rassegno Settimanale*, 1881, Gennaio 9.

157. DOBROWOLSKY. Ueber die Veränderung der Empfindlichkeit des Auges gegen Spectralfarben bei wechselnder Lichtstärke derselben. (On the change in the sensibility of the eye to spectral colors during changing intensity of light.) *Arch. f. d. ges. Phys.*, Bd. xxiv; *Klinitscheskaja Gaz.*, Nos. 3 and 4. If the brightness of the spectral blue be increased by means of a convex lens, the following facts are obtained: Blue gives a color-perception with a quantity of light sixteen times smaller than that required for red. The sensibility to blue gradually increases from the faintest degrees to the most intense, and this increase ensues more slowly in faint degrees of brightness, more rapidly in the intenser degrees. The sensibility to red seems to increase rather uniformly from the fainter to the more intense degrees of brightness. On comparing the results obtained with blue and red, it is found that from the maxi-

mum of brightness to the minimum the sensibility to blue everywhere exceeds that to red; with the maximum of brightness the sensibility to blue is 13½ times; with the minimum, 16 times greater than to red. In the mean degrees of brightness the sensibility to blue is only 4 times greater than to red. However, on comparing the red and blue of the solar spectrum without increasing the brightness of the blue by a convex lens, the sensibility to blue is from 2 to 4 times weaker than that to red.

158. DONDERS. Remarques sur les couleurs et la cécité des couleurs. Abstract from a paper read before the Ophthalmological Congress at Cambridge, August 12, 1880. *A. d'Oc.*, 84.

159. DONDERS. Over spectroscopen en spectroscopisch onderzoek, tot bepaling van den kleurenzin. Akad. von Wetenschappen te Amsterdam, Feb. 26, 1881. *Z. M.*

160. DONDERS. Ueber Farbensysteme. *A. f. O.*, Bd. xxvii, 1.

161. DREHER. Neue subjective Farbenwahrnehmungen auf Grund von Kontrastwirkung. (New subjective color-perceptions based on contrasting effects.) *Die Natur*, 1881, No. 31.

162. DE FONTENAY. Om farvesansqvelser. Kopenhagen, 1881. Reprint from Hospitals Tidende. These ARCHIVES, ix, p. 8.

163. FLEISCHL. Ueber die Theorie der Farbenwahrnehmung. (On the theory of color-perception.) *Wiener Med. Blätter*, Bd. iv, No. 24. Neither Hering's nor Young-Helmholtz's theory is proved.

164. VON FREY and VON KRIES. Ueber die Mischung von Spectralfarben. (On the mixture of spectral colors.) *A. f. Anat. u. Phys., Phys. Abth.*, H. 3 and 4. The individual variations occurring in mixtures of homogeneous light are very probably to be referred exclusively to absorption in the yellow pigment in the centre of the retina.

165. GIRAUD-TOULON. Des aberrations du sens chromatique ou du daltonisme. *Arch. Génér. de Méd.*, 1881, Jan., Feb. The frequency of color-blindness amounts to five per cent.; violet-blindness and total color-blindness are very rare. Giraud-Toulon has seen one case of total color-blindness; it coexisted with nystagmus and impairment of the retinal functions. This observation fully coincides with those reported by Nettleship and Magnus. Color-blindness is incurable, but the training of the color-sense is important. He rejects the hypothesis of Young-Helmholtz.

166. GLAN. Ueber Apparate zur Untersuchung der Farbenempfindungen. (On apparatus for the examination of color-perceptions.) *Arch. f. d. ges. Phys.*, Bonn, 1881, Bd. xxiv, H. 7 and 8. Describes a spectroscope of his own construction, which is said to have certain advantages over those hitherto in existence. With it any spectral color can be easily compared with every other in close juxtaposition, and the value of the compared colors given in measurable terms; their relative brightness may be altered at will, and this proportion likewise given in measurable terms, without at the same time altering the tint; every spectral color can also be compared with white, and both altered measurably in their relative brightness; any two spectral colors can be mixed in every proportion and compared with white or any other color. A special advantage of the apparatus in question is that it permits a quantitative determination of

the differences in color-perception, both in respect to the color and the brightness of the tints regarded as equal.

167. DE GRANDMONT. Un procès expérimental pour la détermination de la sensibilité de la rétine aux impressions lumineuses colorées. *Journ. de Thérap.*, No. 11.

168. HARRIS. Color-blindness and visual acuteness in persons employed in the navy and merchant marine. Speech in the House of Representatives, Feb. 18, 1881. Washington, 1881.

169. VON HASNER. Ueber Farbenscheu. (On chromatophobia.) *C. f. A.* There exists a chromatophobia, *i. e.*, an aversion to certain colors, caused by increased irritability. Schröter, of Leipzig, has observed cases similar to Hasner's, which are reported in *C. f. A.*, p. 62.

170. HEAD, CARMALT, JEFFRIES. Remarks on color-blindness. *N. Y. Herald*, Supplement, 1881, Feb. 26.

171. JAGER. Die Farbenblindheit, nach anderer Art beleuchtet. (Color-blindness in a different aspect.) *Die Natur*, No. 15. Pleads for an education of the color-sense in schools.

172. JEFFRIES. Color-blindness among the Anglo-Indian railway employés. *Lancet*, May 14th. The slight percentage hitherto demonstrated among railway employés is due to deficient examination. FITZGERALD.

173. KEERSMAECKER. Diagnostic du daltonisme par la méthode dite des laines colorées. (Diagnosis of Daltonism by the so-called method of colored worsteds.) *Rev. d'Ocul. du Sud-ouest*, No. 5.

174. KEERSMAECKER. Examen de la vision du personnel des chemins de fer en France et en Belgique. (Examination of the vision of the railway employés in France and Belgium.) *R. d'Ophth.*, No. 4. Proposes Holmgren's method as the most practical for the examination of the color-sense among railway officials. He also gives the following procedure: Around a square embroidered in white worsted, variously-colored samples of wool are fastened in such a manner that the confusion colors are adjoining one another. The person examined is to limit each strip with a pair of compasses; the color-blind will always include two or more strips within the compasses. Keersmaecker has also constructed an apparatus for examination in which colored glasses are employed. This apparatus consists of a box inclosing a candle, from which, by means of a plano-convex lens, parallel rays can be thrown upon a diaphragm, the diameter of which can be lengthened. Between diaphragm and lens is a disk with seven colored glasses, which can be pushed in front of the diaphragm one after another. During the examination it is ascertained how large the diaphragm must be in order to still produce a colored impression.

175. KIRCHHOFF. Zur Frage über den Farbensinn der Naturvölker. (On the question of the color-sense of the savages.) *Deutsche Revue*, 1881, March.

176. KOLBE. Geometrische Darstellung der Farbenblindheit. (Geometric representation of color-blindness.) Petersburg, 1881.

177. LANDOLT. Achromatopsie totale. *Arch. d'Ophth. fr.*, 1881, Jan., Feb. Photophobia; S barely $\frac{1}{10}$. The greatest brightness more toward the green; slight shortening at the red end of the spectrum. Visual acuteness in

blue and red light approximately equal; the sensibility to blue and red light greater than normal. The spectrum appeared as a bright ribbon with varying intensity of light.

178. MACÉ et NICATI. De la distribution de la lumière dans le spectre salaire (spectre des daltoniens). (On the distribution of light in the spectrum of Daltonians.) *Rev. Méd.*, No. 3.

179. MACÉ et NICATI. Héméralopie et torpeur rétinienne, deux formes opposées de daltonisme. *Compt. rend.*, No. 24. Hemeralopia is accompanied by blue-blindness; torpor retinæ, by red-blindness.

180. MAUTHNER. Ueber das Wesen und die Bestimmung der Farbenblindheit. (On the nature and the determination of color-blindness.) Lecture read before the Medical Society of Vienna, December 20, 1880. (*Mitth. des Wiener D. C.*, Bd. vii, H. 1 and 2. He terms color-blindness dichromatopia (with a two-colored spectrum) and achromatopy (with a colorless spectrum). Dichromatopia is divisible into xanthokyanopia, *i. e.*, yellow-blue-vision (red-green-blindness), and erythrochloropia, *i. e.*, red-green-vision (blue-yellow-blindness); he denies the existence of a monochromatopia, such as is taught by the theory of Young-Helmholtz. The xanthokyanops sees only yellow and blue in the spectrum; red and green with him have ceased to be contrasting colors and are coördinated to yellow. Mauthner believes all methods of examination to be insufficient, even those of Holmgren and Stilling, and thinks his own alone reliable. He names his method that of the isochromatic powders, and describes it in this wise: Thirty-four little bottles contain variously colored powders; four of them, each one powder in the fundamental colors. All the other bottles contain in superimposed layers either two shades of the same color or two totally different colors; the person examined is to separate the bottles into two divisions: namely, on one side only the one color even if of varying tints; on the other side, the bottles with different colors.

181. MELLBERG. Ueber Farbenblindheit. *Nord. Med. Arch.*, Bd. xii, H. 4, No. 24.

182. MOELLER. Lettera sulla questione del daltonismo. *Bullet. d'Ocul.*, vol. iii, 8.

183. PARINAUD. Détermination numérique de l'acuité visuelle pour les couleurs et la lumière, chromoptomètrie. *A. d'O.*, 1881, March, April.

184. PREYER. Zur Theory der Farbenblindheit. (On the theory of color-blindness.) *C. f. d. Med. Wissensch.*, 1881, No. 1. The facts ascertained by Holmgren with the unilateral color-blind are said to be against the theory of Young-Helmholtz.

185. PREYER. Ueber den Farben- und Temperatursinn, mit besonderer Rücksicht auf Farbenblindheit. (On the sense of color and temperature, with especial reference to color-blindness) *Archiv f. d. ges. Phys.*, Bd. xxv, H. 1 and 2. Contents: History of Young's theory up to 1860. Representation of color-blindness according to this theory. Criticism of Hering's hypothesis. Foundation of a new theory of the sensations of light and color. Comparison of the sensation of the skin and the retina. The hypothesis.

The results obtained with the typical color-blind, especially with the unilateral color-blind, militate against the theory of Young-Helmholtz. Hering's theory

gives rise to the following objections: 1. The determination of the conceptions of brightness and saturation leads to contradictions. 2. The photogenic and chromatogenic processes cannot be conceived as independent of each other. 3. In the neutral gray, white and black are not perceived together, but neither white nor black. 4. The perception of black is the sensation of retinal rest, not directly incited by any increased irritation, as the sensations of gray, white, or the colors. The theory of Preyer teaches the following: The perception of color is the multiple of but two dimensions; it can vary only in intensity and quality. Saturation cannot vary independently, but is included in the determination of intensity and quality. The stronger or weaker sensation of intensity or brightness depends, in the first place, upon the degree of the excitation; the quality, upon the frequency of the exciting vibrations. All rays of light with a wave length considerably greater than 546 furnish warm colors; all those with a wave length considerably smaller, cold colors. In accordance therewith, the spectrum is divided into a warm and a cold half. Light-rays of approximately 546 furnish neither cold nor warm colors. The warm-colored sensations have a character opposed to that of the cold-colored. Red and yellow are more nearly related to each other than red and green; blue and green are more nearly related to each other than blue and yellow. The perception of neighboring contrast-colors is quite different from that of neighboring warm or cold colors by themselves. The sense of color has developed from the sense of temperature, and is to be conceived as an extremely refined sense of temperature restricted to a most sensitive expansion of nerves, namely, that of the retina. (Compare Burnett's paper in these ARCHIVES and this report.) The series of color-perceptions with continuous transitions is analogous to the continuous transitions of perceptions of temperature. Typical color-blindness is based upon a permanent displacement of the point of indifference for color-temperature, and corresponds to that imperfection of the sense of temperature which arises when a large cutaneous surface is kept continuously cooled or warmed. The neutral point for sensations of heat and cold is likewise displaced in such a case.

Every optic-nerve fibre ends in the retina in two cones, one of which is excited only by warm-colored, the other only by cold-colored light-rays, so that the ganglion cell of the retina which receives both excitations transmits to the sensorium by the optic-nerve fibre either the former only or the latter only, or both, it may be in very rapid alternation, or in algebraic addition. The first central ganglion-cell then permits to the excitations of unequal frequency but one road farther for each—the warm-colored excitation reaching the one, the cold-colored only the other, superior ganglion-cell, where it becomes color. Accordingly, the first central ganglion-cell has the function of separating the two excitations.

In the red-green-sighted eye, all the warm-colored cones are only red-perceiving (erythrogenous), all the cold-colored ones only green-perceiving (chlorogenous). There exists, therefore, blue-yellow-blindness with a red-green spectrum. In the yellow-blue-sighted eye, all the warm-colored cones are only yellow-perceiving (xanthogenous), the cold-colored cones only blue-perceiving (glaucogenous); consequently, there exists a condition of red-green-blindness with a blue-yellow spectrum.

In the normal eye, both pairs of cones are present in even proportion, and they are so arranged that erythrogenous and xanthogenous elements are at equal

distances from each other, and from chlorogenous and glaucogenous cones, so that in even the smallest retinal image all chromatogenous excitations may be present. All color-perceptions are only effected by simultaneous excitation of the two pairs of cones. If the excitation with any one color increases, it becomes brighter, whitish, and eventually white; if it decreases, the color becomes dark, and finally black.

If the red and green cones are excited simultaneously and in equal intensity, the nerve undulations produced by the two kinds of ether vibrations are propagated separately as far as the peripheral ganglion-cell; but thereafter, as the one nerve-fibre cannot at one time be excited in a twofold manner, the undulatory frequencies in the nerve substance alternate so rapidly (unless algebraic addition ensues) that neither alone can produce any effect in the central organ. If, however, neither of them produces any effect, no color is perceived; the consequence is, as the vibrations of the nerve substance, if strong enough, must have some effect, an increase in the excitation proper of the retina, *i. e.*, a colorless sensation. Gray or white is perceived when complementary couples of rays are acting.

186. RENÉ. De la cécité des couleurs. (On color-blindness.) *Gaz. des Hôp.*, 1881, Nos. 4 and 5.

187. VON REUSS. Augenuntersuchungen an zwei Wiener Volkschulen. (Eye examinations at two Vienna public schools.) *Wiener Med. Presse*, 1881. The percentage of color-blindness was greater than in the higher schools.

188. ROSENSTHIEL. Discussion de la théorie des trois sensations colorées fondamentales; caractères distinctifs de ces couleurs. *Compt. Rend.*, No. 22.

189. ROTHE. Beschreibung eines Farbenkreisels, den Rothe in Prag construirt hat. (Description of a chromatic top, constructed by Rothe, of Prague.) *C. f. A.*

190. SCHENKL. Roth-Grünblindheit. *Prager Med. Wochenschr.*, No. 23.

191. SIMI. Esame della facolta visive e cromatiche negli impiegati dello ferrovie e dei bastimenti. (Examination of the visual and chromatic faculty among the employés of railways and the marine.) *Bulletin d'O.*, vol. iii, H. 5 and 6.

192. SNELL. Note of a case of color-blindness. *Lancet*, April 30th. Owing to a fracture of the skull, there was red-blindness in the right eye, green-blindness in the left. Pleads for the separate examination of each eye in color tests. FITZGERALD.

193. STILLING. Simultaneous contrast in color tests. *C. f. A.* Polemics against the assertion of Mauthner that simultaneous contrast is useless for the diagnosis of color-blindness.

194. VOGT, KARL. Ueber Farbenempfindung und Farbenbezeichnung. (On color-perception and the designation of colors.) *Natur*, 1881, No. 8. In the dialect of Berne, violet is called brown; the Reviewer can add that exactly the same phenomenon has been demonstrated in numerous primitive people.

B.—ANOMALIES OF REFRACTION AND ACCOMMODATION; LIDS; LACHRYMAL APPARATUS; MUSCLES AND NERVES; ORBIT AND ADJACENT CAVITIES; CONJUNCTIVA, CORNEA, SCLERA.

By Dr. H. HORSTMANN.

Translated by Dr. R. O. Born, of New York.

I.—ANOMALIES OF REFRACTION AND ACCOMMODATION.

195. Hergenstein. The visual acuteness of 26,672 soldiers. *C. f. A.*, 1881, p. 3-7. Dark-pigmented eyes on an average have a greater acuteness of vision than light-pigmented. The average visual acuteness, determined by Junge's test-types, was in the cavalry—1.47, in the artillery—1.29, in the infantry—1.25, and in the reserve—1.23.

196. v. Reuss. Examination of the eyes in two public schools at Vienna. *Wiener Med. Presse*, 1881, Nos. 7 and 8. Among 474 children were 51 per cent. E., 14.5 per cent. M., and 33.9 per cent. H. The number of hyperopes remained stationary, that of the myopes increased in the upper classes.

197. Weber, M. Contribution to the school hygiene of the eyes. *Inaug.-Diss.*, Berlin, 1881. Of 1,400 school-boys and girls at Darmstadt, 40 per cent. were emmetropic, 60 per cent. ametropic; of the latter, 39.7 per cent. were myopic.

198. Schubert. The influence of text which is inclined to the right upon the eyes of school-children. *Bagr. Arztl. Intell.-Bl.*, vol. xxviii, p. 6.

199. Myopia in schools. *Brit. Med. Journ.*, Apr. 9, 1881, p. 565.

200. Buschbeck. The influence of thread work in manufactured embroidery upon the health and especially upon the acuteness of vision in the children engaged in the same. *Vierteljahrsschr. f. gerichtl. Med. u. öffentl. Sanitätswesen*, Jan., 1881. Thread work has a deleterious influence upon the eyes of the children.

201. Siegmund. Researches on myopia and hyperopia. *Berl. Klin. Wochenschr.*, 1881, No. 18. His examinations of myopes and hyperopes lead him to the following conclusions: By continued convergence emmetropes and hyperopes of low or medium degrees can become myopic. Where a high degree of myopia exists at an early age we must assume a congenital predisposition to myopia. In the excursions of the eye the optic nerve causes, at its insertion in the globe, a stretching which causes posterior staphyloma and myopia.

202. Cohn. The eyes of medical students. *Med. Jahrbücher*, 1881, vol. i, p. 22. Among 216 eyes, 116—54 per cent., were myopic.

203. Königstein. The refraction of the new-born. *Wiener Med. Blätter*, vol. iv, p. 20. In 281 new-born children there was not a single myopic eye; they were almost all hypermetropic.

204. HORNER. De la myopie congènitale. *Revue Méd.*, Genève, 1881, No. 1, p. 4. The very rare congenital myopia may be caused by the formation of the skull, since in anisometropia we generally find the myopic half of the head long and narrow, while the hyperopic half appears broader.

205. KUHNT. What rules have to be observed in selecting glasses for myopic persons? *Corr.-Bl. d. allgem. ärztl. Vereins in Thüringen*, vol. x, 1.

206. MENGIN. Quelques considérations pratiques sur le choix des lunettes. *Rec. d'Ophth.*, 1881, p. 160. He speaks of the selection of glasses in the different forms of hyperopia, in hyperopic astigmatism, in amblyopia with hyperopic astigmatism, in myopia, insufficiency of the internal recti, and in anisometropia. v. MITTELSTÄDT.

207. PARENTS. Diagnostic et détermination objective de l' astigmatisme. *Rec. d'Ophth.*, 1881, Nos. 4 and 5.

II.—LIDS.

208. KROLL. The treatment of blepharitis ulcerosa. *Berl. Klin. Wochenschr.*, 1881, No. 9. An ointment of yellow oxide of mercury is applied to the lids, wiped off again, and the ulcers, freed from the crusts, are touched with a two-per-cent. solution of nitrate of silver.

209. SAMELSOHN. A case of blepharoplastic by a flap without pedicle. *Deutsche Med. Wochenschr.*, 1881, No. 9. To form an upper lid he took a flap from the arm; the final result was good.

210. JAESCHE. The operation for trichiasis. *Klin. Monatsbl. f. Aug.*, vol. xix, p. 40.

211. WALDHAUER. Correction in regard to the trichiasis operation of Dr. Kostomyris. *Klin. Monatsbl. f. Aug.*, vol. xix, p. 128.

212. SCHOELER. The operation for distichiasis. Annual report of his clinic for the year 1880, p. 20. In a case of partial distichiasis of the upper lid, he separated the perversely growing eyelashes with their roots from the underlying tissues and by shifting the flaps of skin transplanted them upward.

213. STORY. Palpebral sarcoma. *Brit. Med. Journ.*, Apr. 23, 1881, p. 647. Story removed a sarcoma from the upper lid, which later recurred in the conjunctiva. FITZGERALD.

214. BUZZARD. A case of blepharospasm. *The Practitioner*, June, 1881, p. 403.

215. LANDOLT. Un nouveau cas de blépharoplastie suivant notre procédé. *Arch. d'Ophth.*, vol. i, p. 112.

216. NICATI. Distichiasis vrai des quatre paupières dû au développement de poils à l' orifice des glandes de Meibomius. *Arch. d'Ophth.*, vol. i, p. 182. A young lady had on all the lids parallel to the margin a row of scantily pigmented hairs, 3-4 *mm.* in length, growing from the openings of the Meibomian glands. v. MITTELSTÄDT.

217. REICH. Péliose d' origine nerveuse. *Arch. d'Ophth.*, vol. i, p. 307. The author observed in the course of six months after a secondary cataract operation, that all the ciliæ of the operated eye had become white, whilst the

hairs of the head and beard did not show any change of color. It had probably been caused by nervous disturbances. (The patient was operated on three times.) V. MITTELSTÄDT.

III.—LACHRYMAL APPARATUS.

218. ALT. A case of **adenoma of the lachrymal gland.** These ARCHIVES, vol. x, p. 288. Alt removed an adenoma which had taken its origin from the lachrymal gland. Later there seems to have been a metastatic intracranial process.

219. GALEZOWSKI. Étude sur l' **inflammation de la glande lacrymale.** *Recueil d'Ophth.*, 1881, No. 2. Inflammation of the lachrymal gland is a very rare disease. G. reports seven cases. The disease begins with febrile symptoms; a few days later swelling of the outer portion of the upper lid. The tumor is of doughy consistency and its limits are ill defined. Upon turning the upper lid the swollen lachrymal gland becomes visible. One of the most constant symptoms is chemosis extending up to the corneal margin. Severe pain and abundant lachrymation are rarely wanting. The disease is mostly confined to one side. MARCKWORT.

IV.—MUSCLES AND NERVES.

220. HIRSCHBERG. On the **quantitative analysis of diplopic strabismus.** *Brit. Med. Journ.*, Jan. 1, 1881, p. 5. The paper contains a description of Hirschberg's apparatus for the determination of the field of fixation. (Comp. *Arch. Ophth. & Otol.*, vol. iv, p. 372, etc.) With this instrument the slightest degree of paresis of an ocular muscle can be detected, and the results of treatment accurately verified. In hyperopic convergence with amblyopia of the squinting eye, where a second operation becomes necessary, the position of the eye which is to be operated can easily be ascertained, and from this the effect of the operation calculated. In myopic squint there is generally binocular diplopia. In order to prevent too great an effect the degree of diplopia must be carefully tested before and after the operation. The same has to be done in secondary squint, for instance, in divergence after an operation for convergent squint. If in paralytic squint all other means to remove the diplopia have failed, and an operation is resorted to, the deviation of the squinting eye can be measured with the instrument and the effect of the operation determined. The low but troublesome degree of diplopia which sometimes remains after paresis of the trochlearis, can be found by this method and the correcting prism selected. FITZGERALD.

221. SCHWEIGGER. **Clinical researches on strabismus.** Berlin, HIRSCHWALD, 1881. Schweigger, in a monograph, puts forward his views on squint, which frequently differ from those generally adopted. The principal cause of convergent squint lies in a preponderance of the internal with insufficiency of the external muscles. He then treats of periodic convergent squint, convergent squint in myopia, which is generally developed after the tenth year, of convergent squint after paresis of the abducens, and hysterical squint.

Divergent squint is rarer than convergent squint; periodic absolute divergent

squint is about as frequent as the stationary form. Divergent squint is rare in H., more frequent in E., but it mostly occurs in M. The main factor in this form is the preponderance of the external with insufficiency of the internal muscles. In dynamic squint, insufficiency of the interni or muscular asthenopia, one eye diverges when a near object is fixed, but the divergence disappears when both eyes look at distant objects. We call strabismus parallelus a diminished power of convergence with loss of mobility of the interni, *i. e.*, a relative divergence. Muscular asthenopia occurs more frequently with low degrees of M. and with E., and with H., than with the higher degrees of M. It is proven only by the disappearance of the trouble by the use of prisms.

We must assume that in squint either eye sees separately, just as the laterally placed eyes of many animals. Double vision is only possible, after binocular fixation had been acquired; either eye sees the object in the direction in which it is located. In periodic strabismus there is often binocular fixation without binocular vision, or diplopia. In disturbances of convergence the double images mostly trouble very little; soon the habit of binocular single vision is also lost for distant objects. Binocular fusion, suppression of one image, and, at the same time, seeing with both eyes without binocular fusion can be present in *one* person.

The reduced vision of the squinting eye is of great importance. Weak sight and congenital amblyopia here are identical; it has never been proven that the acuteness of sight of a squinting eye becomes reduced; altogether, we should not speak of an amblyopia ex anopsia. The surprising improvement of vision after a tenotomy depends only upon superficial preliminary examinations.

Squint can, no doubt, sometimes disappear spontaneously, since the relations of tension between the muscles may change, and a fusion of the retinal images is not absolutely required for a proper position of the eyes. In periodic convergent squint with H. we often obtain good results by the use of convex glasses, not in stationary strabismus. A small deviation rarely requires operative interference. If the deviation is 3–4 *mm.*, a tenotomy should be made, but a distribution of the effect upon both eyes is advisable. In a deviation of 5-6 *mm.*, tenotomy of both interni with proper after-treatment is sufficient. In a deviation exceeding 7 *mm.* tenotomy of both interni and advancement of the externus of the squinting eye should be made. The advancement gives excellent results where by former operations the eye had been turned in the opposite direction.

In absolute divergent squint, tenotomy of the externus should always be combined with advancement of the internus. Besides this, frequently a tenotomy of the externus of the fixing eye is required. Where the divergence is not great, a tenotomy of both externi is often sufficient. If there is asthenopia or troublesome diplopia or disfigurement by periodic squint, tenotomy of the externus of one or both eyes according to the facultative divergence, has to be done.

As to the time of the operation, it must be remembered that amblyopia is not the result of strabismus and that, therefore, there is no danger in delay. Under four years we obtain mostly bad cosmetic results, and a later period is much more advisable.

222. DOBROWOLSKY reports a case of convergent squint of long standing without amblyopia ex anopsia. *Klin. Monatsbl. f. Augenheilk.*, vol. xix, p. 121.

223. DOBROWOLSKY recommends in cases where the immediate effect of an operation for latent divergent squint had been too great, to apply a compressive bandage, after the eye had been drawn outward as much as possible. In order to obtain sufficient effect the patient should, for about one or two weeks after the operation, read every day ½-1 hour at a distance of 10-12 inches. *Klin. Monatsbl. f. Augenheilk.*, vol. xix, p. 61.

224. REUSS reports two cases of infantile nystagmus with apparent outward movements. *Centralbl. f. Augenheilk.*, 1881, p. 68.

V.—ORBIT AND NEIGHBORING CAVITIES.

225. SCHOELER reports a case of high degree of asymmetry of the orbital apertures and a depression of the left eye by a congenital neoplasm at the upper orbital margin. *Annual report of his eye clinic for the year* 1880.

226. NIEDEN. Two rare cases of orbital disease. *Klin. Monatsbl. f. Augenheilk.*, vol. xix, pp. 69-75. Nieden observed in a woman 24 years old an ivory exostosis of the right orbit, which disappeared after the use of iodide of potassium. In a builder, who had been covered by falling ground, he observed after the accident a sinking back of the globe, giving an appearance as if the patient wore an artificial eye. The vision of the eye had not been in the least impaired.

227. SANDS. A successful **removal** of an **orbital exostosis**. These ARCHIVES, vol. x, p. 471. The exostosis started from the spheno-maxillary fissure.

228. CARRERAS, ARAGO. **Exostose éburnée** du frontal remplissant les cavités de l' orbite et du cerveau. Présentation de la pièce pathologique. *Rec. d'Ophth.*, 1881, No. 4. Carreras describes an exostosis of the frontal bone which had been slowly developing after a blow with a sickle. During the course of the disease the patient showed cerebral symptoms and convulsions. The autopsy revealed that the tumor had started from the outer portion of the frontal bone, had gradually filled the orbit, and from there had grown into the cranial cavity. It had then attacked the upper jaw and finally entered the nasal cavity. The antero-posterior diameter of the tumor was 12 *cm.*, the transverse 9 *cm.*, its weight 587 grammes. MARCKWORT.

229. GOLDZIEHER. **Gun-shot wounds of the orbit** and the resulting disturbances of vision. *Wiener Med. Wochenschr.*, 1881, Nos. 16 and 17. Goldzieher saw after gun-shot wounds of the orbit permanent blindness by direct lesion of the nerve, but observed also plastic choroiditis and concussion of the retina.

230. YVERT. Des tumeurs de l' orbite en communication indirecte avec la circulation veineuse intracranienne. Formes d' exophthalmie, qui s' y rattachent. *Rec. d'Ophth.*, 1881, No. 182. Yvert observed in a woman a tumor of the right upper lid which had existed for twenty years. It disappeared in the supine position, whilst upon coughing, sneezing, forcible expiration, and especially upon bending the head forward, the tumor became greatly enlarged. Pulsation could never be felt. Y. supposes a varicose dilatation of the ophthalmic vein and an abnormally easy communication between this vessel and the intercranial sinus.

In connection with this case, Y. speaks of the orbital tumors which are in direct communication with the intracranial veins, their symptoms, course, and treatment. MARCKWORT.

231. SCHMIDT-RIMPLER. Exophthalmos from an exostosis which had been caused by a fracture of the orbital margin. *Berlin. Klin. Wochenschr.*, No. 19, 1881.

232. HIGGENS. Case of vascular protrusion of the eyeball. *Brit. Med. Journ.*, April 23, 1881, p. 641. In a woman 42 years old, the disease seemed to have developed spontaneously, and had gradully increased in the course of six months. The symptoms were not very troublesome, but became more marked and necessitated a ligation of the common carotid. Hemiplegia followed, which disappeared after some time entirely. The cure was complete.
FITZGERALD.

233. PANAS. **Goitre exophthalmique,** ou maladie de Basedow ; **nature et traitement** de cette affection. *Arch. d'Ophth.*, vol. i, p. 97. The author gives first a review of the literature on the subject, and then speaks of the different symptoms, trying to find an etiology applying to the whole complex of symptoms. The disturbances of the vascular system and of the eye do not depend upon simple paresis of the cervical sympathetic nerve. In that affection palpitations of the heart are absent and the dilatation of the large cervical vessels is never as great as in Basedow's disease. There is venous congestion of the eye, myosis, the eye is sunken, and the palpebral fissure is narrow. In Basedow's disease only the anterior ciliary arteries are enlarged, there is no myosis, but exophthalmus and a large palpebral fissure ; with the ophthalmoscope we see retinitis (?), pulsating arteries, the veins sometimes larger, sometimes smaller. Exophthalmus develops independently from the disturbances of circulation and respiration caused by struma, since it sometimes precedes the latter, neither does an irritation of the sympathetic by the struma with contraction of Müller's orbital muscle explain a considerable degree of exophthalmus. Basedow's disease is an affection of the nervous system, and the question is, whether its seat is peripheric or central, and whether it is caused by irritation or paralysis. The present views are that there are symptoms of irritation and paralysis in the system of the sympathetic, but it is not explained how the same cause can at the same time produce opposite effects upon the same nerve. From the constant participation of the heart the seat of the disease has to be sought in the medulla oblongata, where the inhibitory nerves of the heart take their origin. To explain the increased action of the heart there remain, then, two theories: paresis of the inhibitory nerves, or irritation of the sympathetic fibres of the heart. Vulpian is in favor of the latter hypothesis, which is more in accordance with the symptoms of hyperæsthesia and the increased reflexes of the skin and tendons. The symptoms on the part of the blood-vessels do not depend upon a paresis of the contracting, but upon an irritation of the dilating, nerves. On account of the nervous symptoms which are frequently present in Basedow's disease and the recently-observed glycosuria, the author himself assumes also a central seat, but admits the hypothesis of the paralytic character of the disease.
V. MITTELSTÄDT.

234. COHN. Exophthalmometry, *Eulenberg's Real-Encyclopädie*, vol. v, p. 153

VI.—CONJUNCTIVA, CORNEA, SCLEROTIC.

235. HAUSSMANN. The prophylactic treatment of infection of the eyes during the birth of a child. *Arch. f. Gynäkologie*, 1881, No. 1.

236. HAUSSMANN. The origin and **prevention of ophthalmia neonatorum.** *Centralbl. f. Gynäk.*, 1881, No. 9. Haussmann advises, before confinement, to make repeated injections of a two-per-cent. solution of carbolic acid into vaginæ with increased secretion, and to cleanse the eyes of the child immediately after birth by pieces of linen soaked in a one-per-cent solution of carbolic acid.

237. CREDÉ. The prevention of ophthalmia neonatorum. *Arch. f. Gynäk.*, vol. xvii, pp. 50–53. At the gynæcological clinic of Leipzic, Credé disinfected the eyes of all the new-born by an instillation of a two-per-cent. solution of nitrate of silver, after they had been cleansed with water, followed by salicylated compresses for 24 hours. All the children thus treated remained free from blennorrhœa.

238. OHLSHAUSEN. The prophylaxis of conjunctival blennorrhœa in the new-born. *Centralbl. f. Gynäk.*, vol. v, No. 2. Ohlshausen has for two years washed the eyes of the new-born with a one-per-cent. solution of carbolic acid, after the child had been bathed and the cord severed; lately he has washed the eyes with a two-per-cent solution of carbolic acid immediately after birth, before the eyes were opened. By these applications the number of blennorrhoic ophthalmias has become much smaller and of a much milder character.

239. ABEGG. The prevention of ophthalmia neonatorum. *Arch. f. Gynäk.*, vol. xvii, p. 501. To guard against ophthalmia, Abegg has used a two-per-cent. solution of nitrate of silver in women who were affected with fluor; the eyes of the new-born were washed with clean water only.

240. HIRSCHBERG and KRAUSE. The pathology of infectious eye-diseases. *Centralbl. f. Augenh.*, 1881, pp. 39–43. The authors give contributions to the pathology of the infectious diseases of the eye, especially gonorrhoic conjunctivitis.

241. ROTHMUND. The present views on the infectious diseases of the eye. *Bayr. ärztl. Intelligenzbl.*, Nos. 7 and 8, 1881. A short review of the current views on infectious eye-diseases.

242. A. GRAEFE. The caustic and antiseptic treatment of conjunctival inflammations, especially of blennorrhœa neonatorum. *R. Volkmann's Samml. Klin. Vorträge*, No. 192, 1881. Graefe speaks of blennorrhoic, croupous-diphtheritic, and follicular-trachomatous conjunctivitis and their treatment.

243. SCHÖNHALS. The blennorrhœa of the new-born. *Inaug-Dissert.*, Berlin, 1881.

244. v. FORSTER. Hydrochinon an antiseptic remedy in ophthalmic practice. *Bayr. ärztl. Intelligenzbl.*, vol. xxviii, No 22. v. Forster calls attention to the superiority of hydrochinon over other antiseptics in ophthalmic praxis.

245. BOUNTAH. **Ophthalmie d' Egypte.** *Rec. d'Ophth.*, 1881, No. 1. Boüntah remarks that the Egyptian eye-disease in the Orient is frequently transferred from one person to another by the numerous insects, and is much favored

by the uncleanliness of the lower classes. Besides, climatic influences contribute considerably to the development of the disease. MARCKWORT.

246. BRUTÉ. Des granulations de la conjonctive palpébrale et leurs rapports avec les différents états constitutionels. *Arch. d'Ophth.*, vol. i, p. 314. The author holds that in granulations of the conjunctiva there are sometimes similar inflammations in other mucous membranes, and that they are produced by the same constitutional affection. The local disease disappears only after the former has been cured. He tries to support his view by a number of cases. V. MITTELSTÄDT.

247. PONCET. Deux cas de pannus granuleux guéris par inoculation. Rheumatisme blennorrhagique sans uréthrite, apparaissant avec la suppuration conjonctivale. *Arch. d'Ophth.*, vol. i, p. 213. Poncet reports two cures of trachomatous pannus by the inoculation of gonnorrhoic pus, and opposes the numerous accounts of good results to the doubts of other authors. The second case is of special interest, since after the inoculation of one eye there was an affection of the knee- and finger-joints, which disappeared after four weeks, the same complication occurring after the inoculation of the second eye, where it lasted two months, and without further recurrence. MITTELSTÄDT.

248. SÉDAN. Note sur l' emploi de **iodure d' argent naissant dans le traitement des maladies de la conjonctive.** *Rec. d'Ophth.*, 1881, No. 5. Sedan recommends the following treatment in granular conjunctivitis: A few drops of a solution of iodide of potassium in glycerine (3.32 : 10.0) and of a solution of nitrate of silver (3.56 : 10.0) are, at the same time, brought into the conjunctival sac. The iodide of silver which is thereby formed is said to have an exceedingly beneficial effect. MARCKWORT.

249. WALB. The inflammation of the bulbar conjunctiva in old people. *Deutsche Med. Wochenschr.*, 1881, No. 25. Walb calls attention to a form of conjunctivitis which is only found in old people. The palpebral conjunctiva appears perfectly smooth and free from inflammation, whilst the bulbar conjunctiva, especially at the upper corneal margin, shows a marked injection, in which also the subconjunctival vessels participate. There is at the same time more or less swelling of the conjunctiva and increased secretion.

250. BURNETT. A case of **acute chemosis.** These ARCHIVES, vol. x, p. 157. The author reports a peculiar case of chemosis in a man 29 years of age, who was suffering from malaria. Besides the presence of atrophic patches of the choroid, an opacity of the retina at the yellow spot had been stated, later acute chemosis set in, first in one eye, then in the other.

251, HILBERT. A case of intermittent catarrhal conjunctivitis. *Centralbl. f. pract. Augenheilk.*, 1881, pp. 131–133. Hilbert observed in a man an intermittent acute conjunctivitis, which disappeared by the use of quinine.

252. DOBROWOLSKY, by mistake, touched exuberant granulations of the conjunctiva with caustic potassa instead of with the mitigated stick, and produced symblepharon. *Klin. Monatsbl. f. Augenheilk.*, vol. xix, p. 161.

253. MASCHEK. A case of hypertrophy of the plica semilunaris. *Klin. Monatsbl. f. Augenheilk.*, vol. xix, p. 113. He removed a tumor from the conjunctiva which proved a greatly hypertrophied plica semilunaris.

254. RÄHLMANN. **Amyloid degeneration of the conjunctiva.** These

ARCHIVES, vol. x, p. 171. The author states that the amyloid degeneration of the conjunctiva is always preceded by a stage of hyaline degeneration; the formation of amyloid bodies in conjunctival tumors must always be regarded as accidental, occurs only at a later stage, and then only as a secondary formation. It is in no connection with the formation of trachoma granules. After partial extirpation the tumors can be entirely absorbed.

255. REICH. Siderosis conjunctivæ. *Centralbl. f. Pr. Augenheilk.*, vol. v, p. 133. Reich designates by this name a condition of the conjunctiva in which, in its tissue, iron can be observed for a long time without producing symptoms of irritation. The author has observed several cases.

256. DESPAGUET, FELIX. Du traitement du **ptérygion, opération par encoulement** (procédé de Galezowski). *Rec. d'Ophth.*, 1881, No. 6. Despaguet recommends the following method of operation, devised by Galezowski: It is dissected off from the apex to the base, then two needles of a double-mounted thread are passed through the apex, thus forming a loop over it; the needles are then passed through the base of the pterygium from within outward, at the lower and upper margins, and the thread tied. The pterygium is thus rolled up and becomes atrophic. MARCKWORT.

257 MARTIN. De la cautérization ignée comme complément de l' operation du ptérygion. *Annal. d' Ocul.*, 1881, March–April. To avoid relapses after the operation, Martin recommends, after removing the growth and uniting the conjunctiva, to pass over the corneal defect a red-hot squint hook or a galvanocaustic apparatus. Several cases operated in this manner proved successful. MARCKWORT.

258. HACHE. Note sur un kyste de la conjonctive bulbaire. *Rec. d' Ophth.*, 1881, No. 2. A pedunculated cyst of traumatic origin started from the bulbar conjunctiva. MARCKWORT.

259. FUCHS. The use of the actual cautery in corneal affections *Wien. Med. Wochenschr.*, No. 22. Fuchs recommends the use of the red-hot iron in corneal abscesses where the expectant treatment had been without benefit, and where Saemisch's operation was not indicated.

260. JUST. The **treatment of hypopyon by massage.** *Centralbl. f. Augenheilk.*, 1881, p. 173. Just tried by stroking and gently rubbing the lower lid from below upward to distribute the pus over the whole anterior chamber and, in several cases, caused a rapid absorption of the pus.

261. DÜRR. Clinical contributions to my paper on **keratoplasty.** *Klin. Monatsbl. f. Aug.*, vol. xix, p. 145. Dürr details the clinical histories of three cases of transplantation of cornea in rabbits' eyes operated according to his method. Whilst Neelsen and Angelucci assume that the healing of the corneal wound takes place by vascularization and new formation of conjunctival tissue, the author demonstrates healing processes in the transplanted flap and the remaining cornea without any new-formed tissues.

262. LEWKOWITSCH. A rare case of **ribbon-shaped keratitis.** *Klin. Monatsbl. f. Aug.*, vol. xix, p. 250. Lewkowitsch describes a case of ribbon-shaped keratitis in an eye with large and immovable pupil and without any other abnormity. The other eye was entirely normal.

263. GALEZOWSKI. Sur la dégenérescence calcaire de l' epithélium

cornéen et sur son traitement. *Rec. d' Ophth.*, 1881, No. 6. At the microscopical examination the opaque epithelia of these eyes are cleared up by hydrochloric acid, with formation of gases; acetic and osmic acids have no effect upon them. Galezowski, from his own experience, is opposed to iridectomy in this process, and recommends to scrape off the scales. The trouble is caused by phosphaturia. The urine of such patients contains an abundance of phosphates and calcium salts. The organism is overladen with these salts, and they are eliminated through all the avenues of excretion. MARCKWORT.

264. TRÜMPY. Two cases of peculiar deformity of the cornea. *Inaug.-Dissert.*, Zurich, 1881.

265. SENATOR demonstrated in the society of charity hospital a case of anæsthesia of the termini of the left trigeminus, the loss of taste in one half of the tongue, and neuroparalytic ophthalmia and suppuration of the cornea. *Berl. Klin. Wochenschr.*, 1881, No. 6.

266. PAGENSTECHER. The use of **massage in eye-diseases**. These ARCHIVES, vol. x, p. 424. He recommends massage in old corneal opacities, in pustular conjunctivitis, and scleritis.

267. PEDRAGLIA. Massage in recent episcleritis. *Centralbl. f. Augenheilk.*, 1881, p. 3. Pedraglia used massage as recommended by Pagenstecher in two recent cases of episcleritis with good results.

268. Adamück. The operative treatment of scleritis. *Centralbl. f. Augenheilk.*, 1881, p. 12. He recommends to incise the circumscribed swelling.

269. SCHROEDER. The treatment of eye-diseases by pilocarpine. *Petersburger Med. Wochenschr.*, vol. vi, p. 5. Schroeder observed after injections of pilocarpine improvement in episcleritis as well as in parenchymatous keratitis.

270. DESFOSSES. **Staphylome intercalaire.** *Arch. d'Ophth.*, vol. I, p. 156. In the eye of a woman, 35 years old, after a stab-wound, an intercalated staphyloma had developed in the upper half, accompanied by repeated glaucomatous attacks. Severe symptoms of irritation necessitated the enucleation of the blind eye. The optic nerve was excavated, the corneal tissue vascular, Bowman's membrane destroyed, and the atrophic iris adherent to the cornea in the centre and periphery. The ciliary muscle atrophic in the upper half, entirely destroyed at the site of the staphyloma. The sclerotic at that place was very thin and covered with a layer of pigment; the fibres of the zonula were ruptured and the deformed, cataractous lens dislocated downward and forward. The author thinks that secondary glaucoma, set in after the obliteration of Fontana's spaces, had brought about sclero-choroiditis anterior with thinning of the sclera, and that the staphyloma was produced by the increased intraocular pressure. V. MITTELSTADT.

271. v. REUSS. Hornhauterkrankungen. (Affections of the cornea.) *Eulenberg's Real-Encyclopädie*, vol. vi, p. 560.

272. v. REUSS. Hornhauttrübungen. (Opacities of the cornea.) *Ibid.* vi, p. 588.

273. KLEIN. Hypopyon. *Ibid.*, vii, p. 37.

C.—IRIS AND UVEAL TRACT, GLAUCOMA; REFRACTIVE MEDIA (LENS); RETINA AND OPTIC NERVE (AND THEIR FUNCTIONAL DISTURBANCES); INJURIES, FOREIGN BODIES (PARASITES); AFFECTIONS OF THE EYE IN CONSTITUTIONAL DISEASES.

By Dr. A. NIEDEN.

Translated by Dr. Fr. E. D'Oench, New York.

I.—IRIS AND UVEAL TRACT.

274. Adamück. **The ætiology of disseminated chorioiditis.** *C. f. A.*, vol. v, 1881, p. 71. According to statistics it occurs in 0.25 per cent. of all cases, of which only 37½ per cent. are women. Adamück considers the disposition for this disease to be congenital in most cases; he mainly bases his opinion on the fact that it often occurs in members of the same family, and frequently in connection with retinitis pigmentosa; like the latter disease it shows atrophy of the nervous elements of the disc and retina, and is also progressive and incurable (?).

275. v. Becker. Congenital irideremia. Report of cases. *Tensk. Läkarek Händl.*, vol. xxii, 5 and 6, p. 434.

276. Berlin, R. Plastic chorio-retinitis in gunshot wounds of the orbit. *Wien. Med. Wochenschr.*, Nos. 27 and 28.

277. Cohn, H. **The anatomy of persistent pupillary membrane.** *C. f. A.*, vol. v, 1881, p. 97. The first microscopical description of a piece of this membrane, in which the root-like fibres were shown to consist of the same dense fibrous tissue as the adjacent parts of the iris, and presented a striated appearance, here and there, especially at the transitional folds, wavy, and containing many capillaries. The appendages terminate bluntly and obliquely. Very little epithelium was found on either surface. The blood-vessels came from those of the iris.

278. Dehenne. Ossification de la chorioide. A case. *France Méd.*, No. 43, 12 Avril, 1881.

279. Deutschmann. *Zeh. Kl. Monatsbl., f. A.*, März, p. 81. Path. anatomy of coloboma of the iris and choroid as a basis for an explanation of cases of so-called arrest of development in general.

A rabbit, whose father had artificial defects of the eye, is affected with a coloboma of the iris and choroid. The latter consisted only of hyperplastic choroidal tissue and a thickened sclera; the retina was wanting. Evidently inflammation had set in during fœtal life, resulting in sclero-choroiditis, and the author, as also Schmidt-Rimpler (*G. A. f. Ophth.*, vol. xxvi, 2, p. 221), is inclined to ascribe the ætiology of congenital choroidal coloboma to the same process.

280. DEUTSCHMANN. Genuine **tuberculosis of the iris and ciliary body** in a child five years old. Microscopical appearance. The patient still lives, seven years after the enucleation of the affected eyeball, thus making the diagnosis of local tuberculosis tolerably sure. *G. A. f. O.*, vol. xxvii, 1, p. 317.

281. DEUTSCHMANN. **Sarcoma of the choroid** in a very early stage in a man forty-four years old. Enucleation of the globe, though its power of vision had not been destroyed. Microscopical appearance: spindle-celled sarcoma. *G. A. f. O.*, vol. xxvii, 1, p. 308.

282. GIRAUD-TEULON and MASSE. **Cysts of the iris** due to an eyelash remaining on the iris after an injury, in shape of two pearly dots. Giraud-Teulon distinguishes three kinds of cysts of the iris: 1, cysts whose inner surface is lined with epithelium, and which contain serum; 2, dermoid cysts; 3, cysts like those described above, which in reality are tumors of the same structure as the pearly epitheliomata. In the majority of cases they are of traumatic origin, and develop in the epithelium. *Le Progrès Méd.*, 12 Mars, 1881.

283. GUAITA. **Cysts of the iris.** *Ann. di Ott. del Prof. Quaglino*, 1881, Fasc. 1. A cyst developed spontaneously in the left eye of a child four months old, in the inner inferior part of the iris, of the size of a grain of corn, and almost closed the pupil. The tumor mainly consisted of the endothelium of the anterior chamber and its basal membrane. In the region of the lig. pectinatum a number of papillary vascular excrescences projected into the cavity of the cyst. For histol. details *v.* the original.

284. HOCK. The **connection between interstitial keratitis and specific iritis.** *Wien. Med. Presse*, No. 22, H. 10 and 12, p. 293. Conclusions: The combination of iritis with parenchymatous opacities of the cornea of adults is so characteristic of syphilis, that from this alone the diagnosis of lues can be made. If there are no other symptoms of syphilis, it must be concluded to be an inveterate case. Punctiform interstitial keratitis is very rare in advanced cases of syphilis as a disease *per se*, though in one eye iritis may occur combined with keratitis, in the other keratitis alone. The diffuse opacities disappear rapidly under antisyphilitic treatment, but not the punctiform ones.

285. MOORE (Hereford). **Flaccidity of the iris during life.** *Brit. Med. Jour.*, Jan. 15, 1881, p. 137. Three cases are reported, in one of which death ensued the next day after the appearance of flaccidity of the iris; in the other, two days later. During the last six years Moore has observed this phenomenon in many cases before death, and during the last moments of the patients, and, with the exception of these three cases, always noticed it only at the moment of death. FITZGERALD.

286. MORTON, STANFORD A. **Flaccidity of the iris in real death.** *Brit. Med. Jour.*, Jan. 22, 1881, p. 146. In opposition to the preceding, M. thinks this condition is quite commonly present during life. In almost every case he tested, including some under anæsthetics, he found that the pupil appeared to be more or less altered in shape by simple pressure with one finger on the upper part of the globe in the ciliary region.

287. ROCKLIFFE (Hull). Coloboma of the choroid and iris (*Brit. Med. Jour.*, March 12, 1881, p. 385) in a boy four years old, with nystagmus in both

eyes. There was a coloboma of the iris in the right eye, which was continued into the choroid. The macula lutea and optic nerve were both within the coloboma and not distinguishable. In no other organ could any evidence of imperfect development be found. FITZGERALD.

288. ROMIÉE. **Melano-sarcome de l'iris.** *Rev. d'Ophth.*, No. 4, April, 1881, p. 207. Primary melano-sarcomata of the iris are rare. The tumor, which is not accurately described, developed in a woman 74 years old, and occupied the whole anterior part of the eyeball. Enucleation. The examination showed detachment of the retina. Choroid, sclera, and lens intact. The tumor originated in the iris, of which only a small inferior portion remained; about three-fourths of the cornea had also become involved. The tumor consisted of two parts, one of which contained considerable pigment; microscopically of small round cells. V. MITTELSTÄDT.

289. ROOSA (New York). Inflammation of the uveal tract. *Med. Rec.*, vol. xix, No. 7, No. 536, p. 169.

290. RÜTER (Hirschberg's clinic). *A. f. A.*, vol. x, 2, 1881, p. 147. **Tuberculosis of the iris** in a child two years old, combined with hydrocephalus. Enucleation. Microscopic appearance. Three months later epileptiform attacks set in, hemiplegia of the left side, and, six months later, death.

291. STREATFEILD. Reports of two cases of **sarcoma of choroid** and one case of **traumatic hemorrhage into the vitreous.** Royal London Ophth. Hospital. *The Lancet*, April 30, 1881, p. 697. FITZGERALD.

292. TREITEL. A case of a very large **gumma of the iris**; recovery with partial caseous degeneration. *Berl. Klin. Wochenschr.*, 1881, No. 28.

II.—GLAUCOMA.

293. The **pathology of glaucoma.** Editorial of the *Brit. Med. Jour.*, March 19, 1881. *C. f. A.*, vol. v, p. 142. According to the present views and theories, the following facts are considered established: 1. The intra-ocular liquid can only escape in the angle between cornea and iris. 2. Under normal conditions, a stream passes from the vitreous to the aqueous humor through the suspensory ligament. 3. A slight increase of pressure in the posterior chamber obstructs this channel by pressing the ciliary processes against the iris, thus obliterating the angle between cornea and iris. 4. This angle scarcely ever is preserved, or if so, there are traces of a former obliteration. 5. The ciliary muscle is frequently atrophic. 6. The blood-vessels of the ciliary region are often found dilated. Further observations are necessary to confirm the assumption (Priestly Smith), that the increase of the diameter of the lens plays an important part in the etiology of glaucoma.

294. DOBROWOLSKY. **Glaucoma sympathicum.** *Zeh. Monatsbl. f. Klin. Augenheilk.*, März, 1881, p. 128. Acute glaucoma developed in one eye, after the other had become atrophic and phthisical in consequence of an injury. The glaucoma disappeared after iridectomy, but V did not improve until after the removal of the stump, which still was painful.

295. INTORRIANO. Contrib. à l'étude du glaucome hæmorrhagique. *Thèse de Paris*, 1881.

296, MINOR. A review of three anomalous cases of glaucoma. *N. Y. Med. Jour.*, Feb., 1881.

297. SCHÖLER, H. Clinical contributions to the knowledge of glaucoma and its treatment. The author seeks to prove that the occlusion of the angle between cornea and iris is not a *conditio sine qua non* for the development of glaucoma, by reporting the clinical history of several cases. *Jahresber. d. Augenklinik* f. 1880. Berlin, *Peters*, p. 24 ff.

III.—SYMPATHETIC OPHTHALMIA.

298. KRAUSE (Hirschberg's clinic). **Spontaneous recovery** from a very severe case of symp. iridocyclitis. *C. f. A.*, vol. v, 1881, p. 7. It developed 5½ weeks after the injury; immediate enucleation, merc. inunction, etc., repeated relapses, increase of the intra-ocular pressure, almost total blindness. Pupil totally adherent, shallow excavation of the disc, and spontaneous arterial pulse. About two years later, Sn 1½ at 4″, fingers at 15′, whitish discoloration of the disc, no arterial pulse, absolutely no more symptoms of inflammation.

299. LEBER. Observations on the **development of sympathetic ophthalmia.** *G. A. f. O.*, vol. xxvii, 1, p. 325. The author adopts the theory of transfer by infection, as there is no basis for the assumption of direct or reflex nervous irritation. In the papilla of four eyes, Leber found evident hyperplasia of the intervaginal tissue of the optic nerve, and hypertrophy of the endothelium; also marked hyperplasia on the section of the nerve. Infection takes place, not by metastasis through the blood-vessels, but through the contiguity of the tissues, through the optic nerve. It requires, however, from six to eight weeks for the septic infection to reach the nerve of the other eye. Observations of the beginning of inflammation after the lapse of a year are doubtful, as they are frequently only cases of sympathetic neurosis. An infectious origin is probable, on account of the extention of the inflammation over so many parts, its great pertinacity, frequent relapses, and the occurrence, though rarely, of sympathetic inflammation after the first affected eye has been enucleated. It does not often accompany acute panophthalmitis, as the irritating substances are partly discharged, partly destroyed. The increased irritability of the injured globe for pressure only indicates that the inflammation still continues. It is only difficult to explain why the symptoms of sympathetic inflammation always manifest themselves in the uveal tract. The microscopic examination of a case of sympathetic ophthalmia is reported, which had set in after optico-ciliary neurotomy had been performed; countless numbers of very minute, rapidly moving corpuscles were found in the atrophic nervous substance, and also in the eyeball itself.

300. PECK. Symp. iridocyclitis through symblepharon. Etiologically more than doubtful case. *N. Y. Med. Rec.*, April 16, 1881.

301. SICHEL, A. De l'ophthalmie symp. conséc. à l'opération de la cataracte, suivi d'un examen histolog. des yeux énucléés par Poncet. *Rev. a'Ocul. du Sud-ouest*, vol. ii, No. 9, p. 193.

302. WOOD WHITE, E. W. (Birmingham). Injury to one eye, enucleation, sympath. iritis in the other setting in five days afterward. *Brit. Med Journ.*,

April 16, 1881, p. 596. The patient was treated by Dr. Owens, and recovered by the application of leeches to the temples, atropine, mercurial inunction, and internal use of quinine. FITZGERALD.

IV.—REFRACTIVE MEDIA. LENS.

303. BACHE. Étude sur la cataracte second. et sur son traitement en partic. *Thèse de Paris*, 1881, 4, i.

304. BAUDON. Congenital bilateral dislocation of the lens upward and inward in a young woman 21 years old; of the other 4 children, 2 brothers presented the same anomaly. *Rec. d'Ophth.*, 3 S., No. 4, Avril, 1881.

305. BELLONARD. Spontaneous dislocation of the lens into the anterior chamber. *Arch. d'Ophth.*, vol. i, p. 164. In a fireman, 53 years old, cataract had suddenly developed in the right eye 22 years ago. Vision was suddenly restored 4 weeks ago. Inflammation of the eye followed, combined with severe pain in the ciliary region. The anterior chamber is found to be occupied by the dislocated and readily movable cataract, shrunken in all its diameters, and closing the pupil with the exception of a narrow crescent outward and inward. Linear extraction downward, healing without irritation. Six weeks later, glaucomatous attack; V—$\frac{1}{8}$. Microsc. examination by Poncet: capsule of lens unaltered, epithelium mostly gone, on the inner surface of the capsule a large number of migrating cells changing to connective tissue. Some of the slightly granular lens fibres contain pigment. V. MITTELSTÄDT.

306. BRESGEN. Contributions to the knowledge of the **injuries of the capsule of the lens**. *A. f. A.*, vol. x, 3, p. 265. Six cases, more or less important, are reported, in one of which a diffuse opacity of the lens cleared up after removing a piece of the corticalis. In the remaining cases the capsule alone was ruptured without any farther injury to the eye. Two cases, caused by contusion, healed with V—1, but circumscript opacities of the lens remained; in one V—$\frac{1}{2}$, and in another there was also atrophy of the optic nerve. The last case was one of a child suffering from basilar meningitis and metastatic purulent choroiditis, in which the capsule of both eyes had been ruptured and the nuclei protruded into the anterior chamber, where they were absorbed.

307. DEUTSCHMANN. **Cataracta nephritica.** *G. A. f. O.*, vol. xxvii, i, p. 315. Of 53 uncomplicated cases of cataract there were 6 nephritic ones, —9.5 per cent. The amount of albumen was very moderate.

308. GALEZOWSKY. De quelques formes particulières des cataractes congénitales. *Rec. d'Ophth.*, No. 3, Mars, 1881, p. 152. Congenital opacities of the lens are frequently hereditary, or develop after strong psychical excitement or injury of the mother during pregnancy. Galezowsky could demonstrate this cause in 13 out of 28 cases of zonular cataract. Description of a case. The author then briefly describes pyramidal cataract, congenital posterior polar, disseminated, and total cataracts. V. MITTELSTÄDT.

309. LANDESBERG (Philadelphia). Spontaneous dislocation of the lens in both eyes, *Zeh. Monatsbl. f. Klin. Augenheilk.*, Juni, 1881, p. 251, in a myope, 61 years old; within the space of 4 years both lenses sank into the vitreous, without creating any disturbance.

310. LAURENT. Contrib. à l'étude des déplacements traumatiques du cristallin. *Thèse de Paris*, 1881.

311. PLACIDO. Cristalloconus polaire antérieur. *Period. de Oftalm. prat. revist. bim.*, Lissboã, 1881. This anomaly of the lens is congenital and progressive. Removal by extraction or discission.

312. POWER. Notes of a case of congenital luxation of lens due (?) to interuterine syphilitic choroiditis. *The Lancet*, April 9th, p. 155.

313. PURTSCHER. Case of **injury of the lens without ensuing cataract.** *C. f. A.*, vol. v, p. 161. The injury was caused by a fragment of iron sixteen years ago. Its track through the cornea, iris, anterior and posterior capsules, can easily be seen, also a delicate thread between the two latter, punctiform opacities of the vitreous, and a circumscript lesion of the choroid and retina at the posterior pole, V=$\frac{1}{15}$, and a scotoma corresponding to that spot.

314. SALTINI (Modena). Sopra alcuni casi di delirio in seguito all' estrazione di cateratta. *Spallanzani*, Gennaio, 1881.

315. VIDOR. **Congenital hard nuclear cataract.** *Wien. Med. Wochenschr.*, Nos. 23 and 24, pp. 644, and 676. Found the same characteristics as those described by A. Graefe at the Heidelberg Ophth. Congress of 1879: hard, firm corticales and nuclei, which greatly resisted division on account of the dense structure of the capsule; yet he does not agree with Graefe in generally adopting the method of extraction in such forms of cataract, but desires modifications according to the species.

V.—VITREOUS BODY.

316. GARDINER. Case of persistent hyaloid canal and artery. These ARCHIVES, ix, p. 473; *A. f. A.*, x, p. 340. It presented the shape of a thread, beginning with a funnel shaped attachment at the papilla, and ending in numerous little blood-vessels at the posterior surface of the capsule; the bright-red reflex and rhythmical motion of an artery were visible.

VI.—RETINA AND FUNCTIONAL DISTURBANCES.

317. AYRES, W. C. A case of **glioma of the retina,** presenting some noteworthy features. These ARCHIVES, ix, p. 174; *A. f. A.*, x, p. 325. Before severing the optic nerve, it is seized with forceps in such cases where gliomatous infiltration of the nerve can be expected, and can thus be readily drawn forward and excised (Knapp). The infiltration extended along the axis of the nerve as far as the entrance of the central retinal artery. The tumor originated in the inner granular layer.

318. BADAL. Micropsie, macropsie et métamorphopsie rétiniennes. *Rev. Hebd. des Scienc Méd. de Bordeaux*, 1881. In addition to muscular, accommodative, and retinal micropsy, a cerebral form may justly be adopted. Micropsy and macropsy are due to an erroneous projection of the impressions received on the retina. In the retinal form of micropsy, which is mainly due to chorio-retinitis, the image falls entirely upon the diseased part of the retina; when it falls beyond, micropsy can no longer be observed. Thus, an object when seen at a distance may seem smaller, while when seen in close proximity it appears

of natural size. In macropsy, which is rarely observed, the periphery of the macula lutea has undergone changes and causes a dislocation of its elements toward the centre.

319. BAYER. Moon-blindness. *Wien. Med. Bl.*, vol. iv, No. 21; *Sitzungsber. der K. K. Ges. der Aerztl.*, p. 645. In the horse it is due to irido-choroiditis.

320. DENISSENKO, G. The condition of the external granular layer in certain diseases. *Virchow's Arch.*, vol. lxxxiii, 1881. In Bright's disease the membr. lim. ext. seems dimmed, the granules lie farther apart than in general. The whole layer is divided into sections by narrow radiating furrows, the enlarged lymphatic spaces, and between the lim. externa and the granular layer there is a space, probably due to the exudation of liquid caused by the increased pressure.

321. DOBROWOLSKY. Diffuse retinitis in a high degree of H. *Zeh. Klin. Monatsbl. f. Augenheilk.*, April, 1880, p. 156. Retinitis in a person with H — 5 D in both eyes, which did not disappear until corrected by a convex glass of 8 D. The author considers the inflammation to be due to the strong accommodation made necessary by the H.

322. DOBROWOLSKY. Neuro-retinitis due to the pressure exerted by a tumor of the lachrymal gland upon the optic nerve. *Zeh. Klin. Monatsbl. f. Augenheilk.*, April, 1881, p. 159. Exophthalmus and diffuse neuro-retinitis resulted ; no choked disc. After extirpating the tumor the exophthalmus disappeared ; only a slight opacity of the retina remained.

323. DUFOUR. Affect. rétinienne prod. par une éclipse du soleil. *Bull. de la Soc. Méd. de la Suisse Romande*, 1879. As a result of this irritation of the retina Dufour found a white spot in the macula, which besides only showed capillary hyperæmia ; 3 weeks later the spot had disappeared without having injured the power of vision.

324. FALCHI (Turin). The action of pus injected into the eye, especially upon the retina and choroid. *Atti de la R. Acad. delle Scienze*, vol. xvi. It produces purulent choroiditis and retinitis. The original cellular and fibrous infiltration is followed by hyperplasia of the connective tissue of the choroid and retina, and finally by atrophy. The retina and papilla suffer most, the region of the large choroidal blood-vessels somewhat less.

325. FUCKEL. Homonymous hemiopia resulting in recovery. *Arch. f. Klin. Med.*, vol. xxvi. In a woman suffering from acute rheumatism and heart disease, there were found paralysis of the left facial nerve, the right oculomotor nerve, and hemiopia of the right half of the field of vision. The case is not clearly described.

326. HULKE. Notes of six cases of neuritis and neuro-retinitis. *The Lancet*, Feb. 5, 1881, p. 210. Cases of the Lond. Ophth. Hosp., 3 of which were accompanied by cerebral symptoms ; the result is not reported, except in two cases in which atrophy set in. FITZGERALD.

327. KROSTA. Case of hemeralopia with greatly contracted field of vision, to within 10° of the point of fixation. Disc yellowish gray, the pigment almost entirely gone, nor could a trace of regenerated tissue be found. *Berlin. Klin. Wochenschr.*, No. 6, 1881; *Sitzungsber. der Ges. der Charité-Aerztl.*, vom 23 Dec., 1880.

328. VAN DER LAAN. Five cases of retinitis proliferans (Manz). *Period. de Oftalm. prat. rev. bim.*, Lisbon, 1881, Nos. 5 and 6, p. 19. In two cases the cause was syphilis, in 2 glycosuria; in the latter, both eyes, in the former only one eye was affected; they began with numerous hemorrhages; frequent relapses, finally destruction of the retina. Paracentesis was successfully employed for the opacities of the vitreous.

329. OPHTHALM. SOCIETY OF GREAT BRITAIN. *Brit. Med. Journ.*, April 9, 1881, p. 567. Optic neuritis in intracranial diseases. In the debate the principal views as to how optic neuritis begins in brain diseases were discussed. FITZGERALD.

330. PARINAUD. De l' **héméralopie dans les affections du fois** et de la nature de la cécité nocturne. *Arch. Génér. de Méd.*, April, 1881. Hemeralopia is not rare in diseases of the liver, especially in chronic forms, for example in cirrhosis; the cause must be sought, not in the coëxistent icterus, but in the alteration of the blood, the result of the affection of the liver and the functional disturbance caused by it.

331. PONCET. Ophthalmoscopic condition in hemeralopia. *Soc. de Biol.*, 28 Mai, 1881. *Progr. Méd.*, 4 Juin, 1881. The author found the veins considerably enlarged, the arteries narrow, peripapillary œdema of the retina, and redness of the disc. In a note (*C. f. A.*, p. 231) Hirschberg opposes this view, he found the fundus normal in all cases of hemeralopia; in three cases, members of the same family, he saw Bitot's white spot at the edge of the cornea.

332. REICH (Tiflis). Fall on the back of the head, sharply outlined defect in the field of vision, partial neuro-retinitis; recovery. *C. f. A.*, vol. v, 1881, p. 100. Three days after the accident, a peripheric defect was found in the field of vision of the left eye outward and downward, to which a whitish opacity in the upper-inner segment of the retina corresponded, which extended to the edge of the disc, rendering the boundary indistinct; other conditions normal and vision good; photopia within the defect. It disappeared under derivative treatment, beginning at the periphery; complete recovery in two months. The author adds farther reflections on the pathogeny of this rare case.

333. ROMIÉE. De l'amblyopie alcoholique. *Rec. d'Ophth.*, No. 3, 2 Fevr., 1881. Nothing new.

334. ROOSA, St. JOHN. Amblyopia due to the abuse of tobacco and alcohol. *N. Y. Med. Rec.*, vol. xviii, p. 668.

335. ST. JOHN ROOSA and EDWARD J. ELY. 1. **Amblyopia caused by the use of quinine.** These ARCHIVES, ix, pp. 41, 81; *A. f. A.*, vol. x, p. 222. Not a clear case. 2. Total amaurosis, the result of a blow. *L. c.*, ix, p. 43, Germ. ed., x, p. 224. Three days after a fall upon the right side of the face amaurosis of the right eye, without any ophthalmoscopic change. Gradual improvement, V increases to $\frac{1}{3}$, but concentric contraction of the field of vision remains.

336. SANTOS FERNANDEZ. Amaurosis from lesions of the eyebrow or orbital region. *The Amer. Journ. of Med. Science*, Jan., 1881. Five cases: in 3, marked atrophy of the nerve; in 2, just beginning; the author never saw glaucoma develop as Wecker believes.

337. SCHNABEL. Contribution to the knowledge of **amblyopia ex anop-**

sia. *Ber. des Natur. Med. Ver. in Innsbruck*, vol. x, 1880, p. 32. In four children affected with cataract, amblyopia remained after the operation, all other conditions being normal. The author would attribute it to degeneration of the cells of the visual centres in the cortical substance of the brain.

338. SCHÖLER, H. Hemianopic homonymous scintillating scotoma. *Jahresber. d. Augenklinik* f. 1880, Berlin, *Peters*, p. 48. Minute description of this rare visual anomaly, its ophthalmoscopic appearance, and the perimetric measurement of the field of vision.

340. SECONDI, R. Sull' amblyopia dei bevitori et fumatori. *Giorn. Internaz. delle Scienze Mediche*, 1881.

341. WALTER (Manchester). Embolism of the central artery of the retina, occurring as a complication of phlegmasia dolens. *Brit. Med. Journ.*, April 2, 155, p. 514. The patient, 26 years old, was received into the hospital, three weeks after her first delivery, on account of phlegmasia alba dolens of the right leg, which had existed for a week. The left leg was then also attacked, but three weeks later she could be discharged cured. According to her statement, she had first noticed that the left eye was blind four days after her delivery. The ophthalmoscope showed anæmia of the retina, blood-vessels scarcely visible, the disc white, the macula lutea of a reddish hue. This condition gradually changed, and finally total detachment of the retina developed.

FITZGERALD.

342. WEBSTER, DAVID. Remarkable case of detachment of the retina, with hemorrhages into the vitreous, simulating an intra-ocular tumor. These ARCH., x, p. 276, *A. f. A.*, vol. x, 3, p. 318. The increased intra-ocular pressure necessitated the enucleation of a globe which five months previously had lost its sight through detachment of the retina. A coagulum composed of two layers was found occupying the whole posterior part of the globe, and was partly of a later, partly of an earlier date.

VII.—OPTIC NERVE.

343. ABADIE. De la névrite optique produite par des néoplasmes intra-craniens qui déterminent la cécité sans entraîner la mort. *Arch. d'Ophth.*, vol. i, p. 145. Of the different intracranial neoplasms the author distinguishes those which, like tubercles, gummata, cysticercus, etc., generally directly endanger life, from those which give rise to the same cerebral symptoms, also produce optic neuritis and, later, amaurosis, but permit recovery. The author thinks that in some of the latter cases there is circumscribed periostitis or ostitis of the inner surface of the skull, especially in scrofulous individuals. Clinical history of two young women, respectively 18 and 22 years old, who presented the symptoms given above.

V. MITTELSTÄDT.

344. EDMUNDS, W. External hydrocephalus, inflammation of the optic nerve. *Brit. Med. Journ.*, May 14, 1881, p. 769. At a meeting of the Pathological Society in London, Edmunds demonstrated the brain of an idiotic child two years old. After removing the roof of the skull eight ounces of fluid escaped; the ventricles were found distended. The thalami optici were small and shrunken, and the optic nerves showed signs of inflammation. Dr. Nettle-

ship found, during life, whitish discoloration of the discs; the pupils reacted upon light. FITZGERALD.

345. GALEZOWSKY. Quelques mots sur la névrite optique et sur sa curabilité. *Rec. d'Ophth.*, No. 4, Avril, 1881, p. 214, and No. 5, Mai, p. 272. In intracranial neoplasms choked disc is not due to dropsy of the vagina of the optic nerve, which often cannot be found at the *post-mortem* examination, while it is met with in other cases in which neuritis had not been observed. The author cites a case of a tumor of the cerebellum in a boy. At the autopsy the sutures of the skull were found widely open, and the parietal and frontal bones covered with small tumors originating in the dura mater. Increased pressure could therefore not be the cause of the neuritis. Probably inflammation sets in in the neighborhood of a cerebral tumor, which communicates itself to the nearest nerve fibres and thus reaches the optic nerve, where either the perineurium or the nerve fibres themselves become affected. v. MITTELSTÄDT.

346. HIRSCHBERG. **A black optic nerve,** with an illustration. *C. f. A.*, vol. v, p. 137. In a boy 9½ years old, amblyopia of the left eye, microphth. cornea, and monolateral pigmentation of the stroma of the iris. The whole substance of the optic nerve is of a uniform dark grayish-black color, upon which the blood-vessels are scarcely visible. Slight atrophic excavation. The disc is surrounded by a broad, white, atrophic choroidal ring. This condition is probably congenital, and due to fœtal development. Bibliography.

347. LEBER and DEUTSCHMANN. Observations on **diseases of the optic nerve and paralysis of the muscles of the eye in injuries to the skull.** *G. A. f. O.*, vol. xxvii, 1, pp. 272–308. Report of ten cases of injury of the skull and unilateral amblyopia resp. amaurosis, where shortly afterward the fundus was found normal, or, at least, showed only slight hyperæmia of the retina, but where gradually atrophy set in. The amaurosis was on the same side as the injury; only once amblyopia of both eyes was observed. In general a direct mechanical action upon the optic nerve may be assumed as the cause, rather than hemorrhage into its vagina. The beginning of the discoloration noticed in 2 or 3 weeks, and this may be regarded as the time which the atrophy requires in descending from the optic foramen to the eye. In this connection is reported a case of optic neuritis, with gradually increasing impairment of vision, and ending in amaurosis, the result of a severe injury of the head; blindness was probably due to basilar meningitis arising from the injury.

348. RAMPOLDI. **Gliosarcoma del nervo ottico.** *Ann. di Ottal.*, vol. x, p. 121. In a girl four years old exophthalmus had gradually developed in the left eye in the course of three years, and had reached such a degree as to dislocate the eye, so that the lids closed behind it. The eye easily moves, and there are no signs of inflammation. Behind the eyeball and filling the entire orbit, an elastic, egg-shaped tumor could be felt, and was removed, together with the globe. It is twice as large as the latter, is separated from the eye by a short piece of the optic nerve, and shows the characteristics of a gliosarcoma. The fibres of the optic nerve in the tumor had been entirely destroyed. Recovery in a month.

349. STORY. Malanotic sarcoma of the eye. *Path. Soc. of Dublin*, Feb. 26, 1881. In a man 21 years old, who had gradually lost sight, a melanotic sarcoma was found at the posterior pole of the eye, which had also attacked the optic nerve.

VIII.—INJURIES, FOREIGN BODIES (PARASITES).

350. GOLDZIEHER. Gunshot wounds of the orbit and the visual disturbances following them. *Wien. Med. Wochenschr.*, Nos. 16 and 17, pp. 440 and 475. In many cases plastic choroiditis, frequently of the posterior pole, is the cause of the impaired vision, and not rupture of the choroid, as is often assumed. Description of two cases. The author is inclined to ascribe these pathological changes to a lesion of the ciliary nerves, and attaches great importance to the latter as the cause of sympathetic inflammation.

351. HASNER. **The injuries of the eye from a forensic point of view.** Handbook of Forensic Med. of Prof. Maschka, vol. i, 1, pp. 309-377. Tubingen, *Laupp*, 1881. The author discusses: 1, simulated and intentional diseases of the eye; 2, the various forms of solution of continuity; 3, changes of the eye though no foreign body remained behind; 4, injuries in which foreign bodies lodged in the eye, mentioning sympathetic ophthalmia in connection with those of the posterior part of the globe; 5, combustion by heat, metals and chemical substances, and 6, intoxications produced by vegetable, chemical, and mineral poisons. Many interesting cases observed by the author himself are reported.

352. HOLMES. A remarkable case of injury of the eyeball. These ARCHIVES, ix, p. 182; *A. f. A.*, p. 330. Pressure with the thumb upon the eyes produced a coloboma of the iris upward and inward and aphakia, also opacity of the vitreous of the right eye. Six years later a blow upon the left eye caused complete detachment of the iris.

353. KNAPP. Ophthalmoscopic appearance in commotio retinæ. These ARCHIVES, ix, p. 279; *A. f. A.*, vol, x, 3, p. 337. In two cases a milky-white discoloration and punctiform hemorrhages of the retina were observed, both of which disappeared in a few days. V remained intact.

354. KRAUSE (Hirschberg's clinic). **Foreign bodies lodged in the fundus of the eye.** *C. f. A.*, vol. v, 1881, p. 105. Three cases are reported, in which small fragments of iron had perforated the cornea, iris, lens, and vitreous, and in one case remained in the eye without causing inflammation, after the cataract had been absorbed. In connection with the question of the eventual preservation of sight in such eyes a case is reported in which V had remained good for three years, after the absorption of the cataract, but then, without any further apparent cause, total amaurosis through detachment of the retina set in.

355. MARCKWORT. **Experiments on lesions of the optic nerve,** *A. f. A.*, vol. x, 3, p. 269. They were produced by compression, ligation, and division of the optic nerve either with or without severing the blood-vessels. The first-mentioned kind of injury was followed by a sudden circumpapillary opacity in the vascular stratum of the retina, which rapidly disappeared as soon as the compression ceased. Ligation directly behind the eye was always followed by atrophy of the optic nerve and retina. Division of the blood-vessels produced total ischæmia of the retina and subsequent atrophy, while simple division of the optic nerve, but not of the blood-vessels, 7 *mm.* behind the eyeball, produced atrophy and formation of connective tissue of the fibrous layer. When the same injury was inflicted at the optic foramen, no atrophy could be noticed in the papilla many months later.

356. PEREYRA, E. Due casi di rottura coroideale. Lo Sperimt., Aprile, 1881; *Boll. d'Ocul.*, vol. iii, Maggio, p. 109.

357. REULING (Baltimore). Case of pseudocyst of the retina containing a foreign body. These ARCHIVES, x, p. 45; *A. f. A.*, vol. x, ii, p. 211. In a phthisical globe a piece of gun-cap was found in a cyst, the walls of which were formed by the retina, and the base by the thickened vitreous. The posterior layers of the retina were destroyed; in the choroid there was a small scar in the region of the horizontal meridian.

358. SANTOS FERNANDEZ. Gunshot wound of both eyes. Absorption of the left lens. Recovery. These ARCHIVES, ix, p. 85; *A. f. A.*, vol. iii, 3, p. 307. The injury was produced by shot. The right eye was enucleated, in the left the lens was absorbed in 4 months.

359. SCHMIDT-RIMPLER. **Fractura oss. occipit. et temp. dextr. Hemianopsia sin.** *Berl. Klin. Wochenschr.*, No. 16. Meeting of the Med. Soc. of Marburg. Fracture with escape of brain matter. Deafness in the right ear. The hemianopsia sin. can probably be ascribed to an injury of the centre of vision.

360. STORY. Injury to the eyeball without external wound. *Brit. Med. Journ.*, March 12, 1881, p. 392. A boy 12 years old received a blow upon the eye from an umbrella 6 days before admission to St. Mark's Hospital. Iritis with formation of posterior synechiæ ensued; 12 days after the accident the eye was enucleated in order to prevent sympathetic inflammation. Dislocation of the lens and detachment of the choroid from the sclera were found at the spot where the blow probably was struck, and at a spot directly opposite. Inflammation of the vitreous had set in near the point of injury. FITZGERALD.

361. WILLIAMS. Continual toleration of foreign bodies within the eyeball for fifteen and twenty-two years respectively. *Brit. Med. Journal*, 1881, No. 4.

IX.—AFFECTIONS OF THE EYE IN CONSTITUTIONAL DISEASES.

362. BARLOW. Pneumonia in an alcoholic subject, necrosis of a portion of lung, endocarditis, renal and splenic embolism, basilar meningitis, and retinal hemorrhages. *Med. Times and Gaz.*, No. 1598, 1881.

363. BAUMGARTEN. The contagiousness of tuberculosis. *C. f. Med. Wissensch.*, 1881, p. 274. The author found that, without exception, the injection of blood of highly tuberculous animals, into the anterior chamber, produced tuberculosis of the iris and universal tuberculosis. It began, in the third or fourth week, at the spot where the infectious blood had collected. The products of disease and the blood of these animals easily produced tuberculosis.

364. BECHTEREW. The symptom of combined deviation of the eyes and head in affections of the cortical substance of the brain viewed clinically. *St. Petersb. Med. Wochenschr.*, 1881, Nos. 11–13. In a person 36 years old, suffering from progressive paralysis, with hemiplegia of the right side, a rotation of the head and eyes, combined with clonic contractions, was observed, at first toward the right side, but shortly before death, toward the left. The autopsy showed internal hydrocephalus, marked atrophy of the frontal and anterior central convolutions, and sclerosis of the right lateral column.

365. BERNHARDT. Case of tumor of the pons with **conjugate deviation** of the eyes in a boy four years old. Paresis of the right facial nerve, paralysis of the abducens of the right eye; five months later, paresis of the left internal rectus muscle. At the autopsy, the right half of the pons was found enlarged, and replaced by a neoplasm which had also affected the nuclei of the facial and abducens nerves. (*Berl. Ges. f. Psych.*, 12, vii, 1880.) *Berl. Klin. Wochenschr.*, 1881, No. 10.

366. BÖCKMANN. Leprosy of the eye. Danielssen Beretning om Lungegaardshospitalets Virksomhed, 1877–79, pp. 43–71. *Cfr. C. f. A.*, vol. v, p. 141. Of 62 new patients, the eyes of 40, —64½ per cent., were affected; of 63 old cases, 47, —75 per cent. Of the former, 24 had the tuberculous form, namely: small, sharply defined dots at the upper edge of the cornea, tubercles on the sclera and cornea, and iritis; while 32 had the anæsthetic form: lagophthalmus, paralytic xerosis of the cornea, posterior synechiæ and opacities of the cornea; while 6 combined both forms.

367. BRESGEN. Amblyopia diabetica without any ophthalmoscopic change in a person 29 years old, combined with a pericentric scotoma, within which the perception of form, light, and color is reduced, while the periphery of the retina has not suffered. *C. f. A.*, vol. v, p. 33, 1881.

368. BYRON. Clinical lecture on intracranial tumors. Changes in the optic discs. *Edinb. Med. Jour.*, No. 308, p. 725, 1881.

369. COURSSERANT. Diabète, affect. cardiaque, importance de l'exploration ophthalm. *Revue Méd.*, No. 3, 1881.

370. DEUTSCHMANN. **Miliary tuberculosis of the brain and its envelopes, and its connection with diseases of the eye.** *G. A. f. O.*, vol. xxvii, 1, pp. 224–254. An experimental study endeavoring to demonstrate the propagation of tuberculosis from the brain and meninges to the optic nerve and its envelopes. After injecting tuberculous pus under the arachnoid, the first symptom observed was clearly marked papillitis in both eyes, which afterward either disappeared or developed into choked disc or atrophy. Genuine tuberculosis of the vitreous was also observed, and constantly of the envelopes of the optic nerve. The infectious tuberculous mass probably advances mechanically in the sheaths to the foramen scleræ; direct infection from the lesion by cellular propagation is improbable. The report of two cases of spontaneous recovery from tuberculous lesions of the brain and eye is of further interest.

371. DIXON MANN. Tumor of cerebellum. *Brit. Med. Jour.*, May 28, 1881, p. 853. In a girl 12 years old: optic neuritis, gradual atrophy of the disc, but a slight power of vision remained. FITZGERALD.

372. DOBROWOLSKY. Uræmic amaurosis the result of œdema of the optic nerve after scarlet fever and nephritis. Ten days later, sight and fundus of the eye were again normal. *Zeh. Klin. Monatsbl. f. Augenheilk.*, März, 1881, p. 121.

373. FAUCHERON. De la **névralgie sus-orbitaire considérée dans ses rapports avec l'œil.** *Rec. d'Ophth.*, 3 S., Nos. 2 and 3. Bibliography. Galvanic and mechanical irritation of the nerve causes unmistakable reaction of the eye, but not division of it. Report of numerous cases. Supra-orbital neuralgia is almost always intermittent, and follows a regular periodicity; it occurs very

rarely in both eyes. This onesidedness and the sensitiveness on pressure upon the supra-orbital nerve must be considered in making a diagnosis. MARCKWORT.

374. FEUER. Metastatic ophthalmia. *C. f. A.*, vol. v, 81, p. 35. In a puerpera who had no fever during confinement, tenonitis and an abscess of the sclera of the left eye developed. The abscess gave rise to infiltration of the vitreous, which finally led to phthisis bulbi. Arterial embolism was probably the cause.

375. GAUTÉ, F. (Tarbes). De **l'influence de la goutte sur** les affections et les opérations de **l'œil**. *Rec. d'Ophth.*, 3 S., 3, Nos. 5 and 6. The author discusses the effect of gout upon the eye, considering the diseases of the lids, conjunctiva, cornea, sclera, iris, episcleral tissue, etc., separately. (*Cfr. Galezowsky*, Études sur les cataractes et sur leur traitement. Cataracte goutteuse. *Rec. d'Ophth.*, 3 S., 2, No. 9.) MARCKWORT.

376. GOWERS. **Syphilis and locomotor ataxy**. *The Lancet*, Jan. 15, 1881, p. 94. The author maintains that all of Hutchinson's cases of external ophthalmoplegia were the result of syphilitic infection, while in the patient whose brain he examined, there was genuine degeneration. The author saw iridoplegia reflectica, *i.e.*, the loss of reaction on light, while the associated action in accommodation is retained, a very common occurrence in tabes—in several syphilitic patients whose spinal cord was not diseased; Erb has also described such a case. Indeed, it may be laid down as a practical rule that, except in paralysis of the insane, iridoplegia reflectica is always a symptom either of syphilis or tabes, and sometimes of both. FITZGERALD.

377. GOWERS. Optic neuritis in chlorosis. *Brit. Med. Jour.*, 21, v, 1881, p. 796. The occurrence of optic neuritis in chlorosis is a very interesting fact, which Gowers has already pointed out in his work on medical ophthalmoscopy (if we are not mistaken, Mr. Hulke reported a case a few years ago in the Royal Lond. Ophth. Hosp. Rep.) Gowers describes two interesting cases, in one of which the neuritis rapidly disappeared on using iron. He never noticed such a rapid development or disappearance of neuritis from cerebral causes. There was amenorrhœa in every case. Absolute rest of both the body and the eyes is necessary to insure recovery. FITZGERALD.

378. HILLE. Hémiopie avec hémiplégie, hémianesthésie. *Gaz. des Hôp.*, 1881. Left-sided hemianopsia, V of the left eye —o. The paralysis gradually disappears entirely, but soon reoccurs; it was probably due to an infarctus of the inner surface of the internal capsule.

379. HOCK. **Bilateral paralysis of almost all the muscles of the eye,** exophthalmus, optic neuritis, abscess behind the globe, in a boy six years old, eight weeks after a fall upon the back of the head. V almost intact, but the choked disc became more marked. After opening the abscess all these symptoms disappeared. The author is inclined to assume a detachment of the lamina vitrea at the base of the skull, followed by purulent inflammation of the episcleral and periosteal membrane. *Arch. f. Kinderheilk.*, vol. ii, 1881.

380. HUTCHINSON. Clinical **remarks** on a case of **amaurosis** and other marked cephalic symptoms in **locomotor ataxy**. *Brit. Med. Journ.*, March 5, 1881, p. 339. A man 45 years old suffered from amaurosis. Three years ago he had ptosis and paralysis of the oculomotor nerve, from which he com-

pletely recovered. The right eye was the first to become amaurotic. Both discs were of a bluish-white color. A short time ago the patient complained of severe stitches in the joints and muscles. The author remarks that he has seen various cases of tabes where cephalic symptoms were the first observed, and which began with amaurosis. He lays stress upon the noteworthy clinical fact that recovery is rare or never occurs when in tabes the optic nerve becomes affected, but that it is the rule when the oculomotor nerve is attacked. Transient ptosis is a very common occurrence in tabes, in fact so common that in a case of spontaneous recovery from ptosis tabes may be diagnosticated. The author has never seen any improvement in amaurosis from tabes, much less recovery.

FITZGERALD.

381. LANDESBERG. **Affections of the eye** consequent upon **lead poisoning**. *Phila. Med. Bull.*, vol. ii, No. 9, Nov. 1880.

382. LITTEN. Changes in the fundus of the eye in anæmia. *Berl. Klin. Wochenschr.*, 1881, No. 1. Read before the Berlin Med. Soc. They are partly only manifestations of the general anæmic condition, partly genuine structural changes of the retina and optic nerve. The latter consist in hemorrhages and whitish-gray spots on the retina, frequently in the centre of a hemorrhage. Besides this, delicate radiated opacities of the papilla and its surroundings are observed, together with whitish striated opacities around the blood-vessels. The papilla is generally only slightly swelled. The striated appearance was due to pus corpuscles ensheathing the blood-vessels. The nerve fibres were here and there sclerotic, hypertrophied. The plaques frequently consisted entirely of masses of white blood corpuscles, and sometimes contained also sclerotic nerve fibres, but they were never composed of these alone. Visual changes are almost exclusively due to the inflammatory form of anæmic retinitis. No form nor any particular stage of anæmia presents characteristic peculiarities; they may occur everywhere, and are therefore of little importance for the prognosis. They are frequently found in cancer of the uterus. The blood in this case contained microcytes; no increase in the number of white blood corpuscles could be observed. No marked fatty degeneration of the heart. Optic neuritis and neuro-retinitis were not observed as often as in acute anæmia from loss of blood. These inflammatory changes generally do not develop before the first or second week, and frequently lead to atrophy of the optic nerve. In venous stasis, resulting from diseases of the lungs and heart, there is hyperæmia of the disc and veins, more or less marked, the principal veins reaching a diameter of 0.2 *mm*. The reflex along the blood-vessels is very distinct. Here also hemorrhages, white plaques, and inflammatory changes in the retina and optic nerve were observed. In one case hypertrophied and varicose nerve fibres were found in the retina. Inflammatory symptoms are proportionately more common than in anæmia; hemorrhages are also of frequent occurrence, both in the course of the inflammatory processes, of emphysema complicated with chronic bronchial catarrh, of kyphoskoliosis, and idiopathic dilatation of the heart combined with venous stasis.

Various cases are then reported, one of a high degree of emphysema and stasis, of poisoning by nitrobenzol, besides three cases of apoplexy of the brain and retina, due to miliary aneurisms.

383. LITTEN. **Septic affections**. *Zeitschr. f. Klin. Med.*, Berlin, vol. ii,

H. 3. A purely nervous symptom of septic infection is the scintillating scotoma; more serious disturbances are always due to structural changes of the membranes and refractive media, and are caused either by embolism or metastatic infection, giving rise to neuritis or metastatic panophthalmitis. The embolus causing the latter may have been driven into the blood-vessels of either the retina or the choroid and iris. In the beginning retinal hemorrhages, generally in both eyes, are always observed, and are frequently due to embolism. Sometimes the capillaries are choked up with zoögloa masses. The white centres of many of these hemorrhages are due to circumscript necrosis of the retina. The encocarditis which frequently accompanies septicæmia bears no causal relation to diseases of the eye; out of 35 cases there were 22 of acute endocarditis, in 17 of which the eyes were also affected, while there were 12 cases of ophthalmic diseases without endocarditis.

384. LANDESBERG. On **affections of the eye caused by masturbation.** *Med. Bullet.*, Phila., vol. iii, No. 4, 1881.

385. MANZ. Two cases of tuberculosis of the human eye.

1. In a boy 2½ years old, of lymphatic scrofulous constitution, both lids of the right eye showed tuberculous infiltration. At the autopsy universal tuberculosis was found.

2. A boy 8 years old suffered from total amaurosis; the retina was detached, the disc atrophic. The eyes showed conjugate deviation to the left. At the autopsy there was found tuberculosis of the brain and spinal cord, the lungs, liver, etc. The choroidal tumors of the left eye were of a tuberculous nature. *Zeh. Klin. Monatsbl. f. Augenheilk.*, Jan., p. 3.

386. NORMAN MOORE. Tumor of the brain. *Brit. Med. Journ.*, May 21, 1881, p. 808. The tumor comprised both optic tracts and the chiasm. Marked atrophy of the left disc, less of the right. Mr. Vernon, who made the first ophthalmoscopic examination, could not positively assert that the right disc showed any thing besides anæmia. Later, when the patient had become blind, both discs appeared equally atrophic. FITZGERALD.

387. NOYES. Acute myelitis, with bilateral optic neuritis. These ARCHIVES, ix, p. 199. *A. f. A.*, vol. x, 3, p. 331. The myelitis began with paresis of the sphincter muscles of the bladder and of the lower extremities. V decreased, first in the right eye, then in the left, while there were hyperæmia and swelling of the nasal half of the papilla. Central scotoma and concentric visual defect. No syphilis. All symptoms, however, disappeared in 3½ months on using iodide of potash.

388. POUSSON. Du rôle des organismes inférieures dans la pathogénie de la chorioidite purulente des femmes en couches. *Arch. d'Ophth.*, vol. i, p. 174. A case of puerperal choroiditis of the left eye. On the 18th day of confinement the author examined the blood, the pus of a metastatic abscess, and of the eye, and found numerous micrococci variously arranged, generally in rosary-shape. In circulating blood the micrococci do not increase. This only happens when they enter a blood-vessel obstructed by an embolus or thrombus, or themselves obstruct a capillary. An abscess is then formed. Perhaps energetic antiseptic treatment at an early stage might check the destructive process. V. MITTELSTÄDT.

389. POWER. Notes on a case of complete ptosis due to irritation from decayed teeth. *The Lancet*, Apr. 9, 1881, p. 575.

390. SCHNABEL. Syphilitic affections of the retina. *Ber. d. Naturw.-med. Vereins in Innsbruck*, vol. xi, pp. 11–19, '80–'81. Out of 40 syphilitic patients, 21 presented ophthalmoscopic changes, and 7 inflammation of the retina and choroid, but none complained of their sight. No anomaly of the vitreous could be found.

391. SCHUBERT (from Prof. Cohn's clinic). **Syphilitic affections of the eye.** Berlin, *P. Lette*, 1880, p. 140. Out of 20,000 patients 231,—1.15 per cent. showed symptoms of constitutional syphilis. Of 520 cases of iritis, 121, *i. e.*, 23 per cent., were of syphilitic origin, which was 52.4 per cent. of all syphilitic diseases of the eye. In 50 cases the iritis was complicated 4 times with keratitis, 36 times with choroiditis, 7 times with chorio-retinitis, 3 times with paralysis of the muscles. Frequently it is the serous form of iritis. It generally appears in the first two years after infection. Gummous iritis occurred in 4 cases out of 121; once disseminated choroiditis of both eyes, but not in connection with syphilis; neither can the punctiform opacities of the vitreous be considered characteristic. Primary affections of the choroid are rare. In 23 cases retinitis and neuritis occurred combined with specific choroiditis, in 9 bilateral. Recovery as well as amaurosis may be the result. The syphilitic paralysis of the muscles is not due to a simple ossifying and gummous basilar meningitis. The author found syphilitic paralysis in 17.4 per cent. of all cases, 27 of the oculomotor nerve, 13 of the abducens, and 1 of the trochlearis. Five cases of dacryocystoblennorrhœa were due to syphilitic caries; in 77 cases,—0.38 per cent., there was parenchymatous keratitis, in 5 of which hereditary syphilis was shown to exist.

392. SPALDING, J. Case of **intracranial tumor,** complicated for five years with marked **ophthalmic symptoms.** Death. Autopsy. These ARCHIVES, ix, p. 160; *A. f. A.*, x, p. 312. First symptom: Paresis of the abducens nerve of the left eye for ten days, followed six months later by complete paralysis of the oculomotor nerve of the right eye. Cephalalgia. Two years later paralysis of accommodation of the left eye, choked disc, and, finally, atrophy of the optic nerve. Then left-sided hemiplegia, anæsthesia, facial paralysis, and total amaurosis ensued; finally, death. At the autopsy there was found a tumor to the left of the clinoid process and extending as far as the foramen magnum and the petrous portion of the temporal bone, and another tumor on the anterior lower surface of the left hemisphere. Nothing is said of the structure.

393. v. WECKER. Des manifest. oculaires diathèsiques, scrofuloses, tuber culeuses, rheumat. syphilit. *Rec. d'Ophth.*, No. 3, Mars, 1881. A general review of these different forms of disease in connection with affections of the eye. Nothing new.

394. WESTPHAL. **Localization of unilateral affections of the brain,** giving rise to convulsions and **hemianopsia.** *Charité Ann.*, vol. vi, 1881. The patient suffered from convulsions, especially of the left side of the body, but remained conscious. Hemiparesis of the left side remained, also a lateral (left-sided) hemianopsia, which was not observed until some time later. The autopsy revealed a lesion in the white substance of the posterior lobe of the right hemisphere, having the appearance of a coarse sieve. Under the microscope many granulated fat cells were found, while the cortical substance had remained intact.

MISCELLANEOUS NOTES.

The medical faculty of the University of Strasburg has announced the following subject for a prize-essay for the year 1881–1882 :

Critical investigation of the sympathetic affections of the eye, considering only the cases resulting from injury.

The following questions are to receive special attention :

What forms of disease of the second eye are undoubtedly of a sympathetic nature ?

In what affections and at what stage of the disease has enucleation proved efficacious ?

Can enucleation be replaced by optico-ciliary neurotomy, according to our present experience ?

Papers must be delivered by March 1, 1882, to the Dean of the faculty.

DR. FUCHS, formerly assistant to the clinic of PROF. V. ARLT, has been appointed Professor of Ophthalmology, at Liege, and has already entered upon his position.

The Manhattan Eye and Ear Hospital, New York.—This hospital entered upon the thirteenth year of its existence, in a new building erected for it by the Board of Directors. The principal contributions toward the edifice, however, have been from the Honorable Edwin D. Morgan. It is of brick, four stories and an attic high, of the Elizabethan style of architecture. Diseases of the throat and nervous system are also treated in the hospital. There is a steam elevator in the building for the transfer of patients from one floor to the other. The hospital fills a lot of one hundred feet front on Park Avenue, by eighty feet on Forty-first Street. The beds for patients number seventy-five or more. About four thousand five hundred cases of diseases of the eye, ear, throat, and nervous system were treated in the old hospital building during the last year. ST. J. R.

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